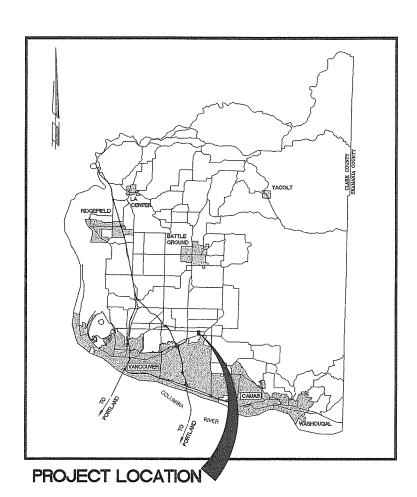
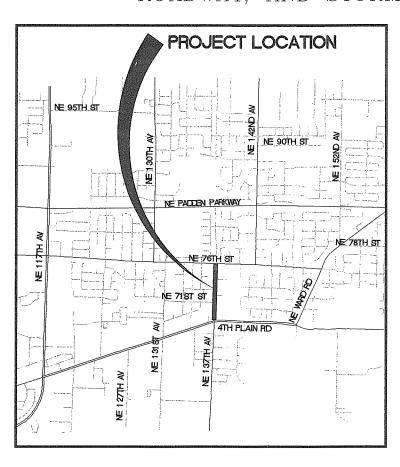
CAPITAL IMPROVEMENTS PROGRAM COUNTY ROAD PROJECT #321122

NE 137TH AVENUE

FOURTH PLAIN BOULEVARD TO NE 76TH STREET

PLANS FOR THE CONSTRUCTION OF ROADWAY, AND STORM DRAINAGE





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COMMISSIONERS:

MARC BOLDT, Chair STEVE STUART, Commissioner BETTY SUE MORRIS, Commissioner



DEPARTMENT OF PUBLIC WORKS



ENG 2003-00142

Quality Ass	urance	Project Manager	PW Director/ County Engineer
The A R	5-5-06	Lon X. andrews 5	-5-06 PETEL CAPEL 5/5/0
Bruce Klug, P.E.	DATE:	Don Andrews, P.L.S.	Peter Capell, P.E.



ENGINEERING PROGRAM- DESIGN SECTION

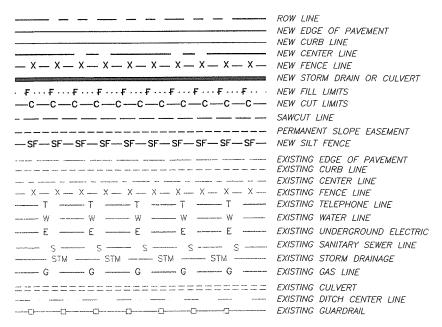
GENERAL NOTES

- 1. SURVEY DATUM PER CLARK COUNTY.
- 2. EXISTING UTILITIES SHOWN ON THE PLANS ARE PER SURFACE LOCATIONS AND 2. EXISTING OF OUR PERMISSION OF THE FUND AND EACH FER STATE CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. IF CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS (INCIDENTAL TO COST OF STORM SEWER
- 3. <u>CONSTRUCTION SURVEY</u> SHALL BE PROVIDED AT NO COST TO THE CONTRACTOR. HOWEVER, THE CONTRACTOR WILL BE RESPONSIBLE FOR REPLACING NEEDED SURVEY STAKES DESTROYED THROUGH NORMAL OPERATIONS, NEGLIGENCE, OR INATTENTION. AS-BUILT SURVEY SHALL BE PROVIDED BY THE CONTRACTOR.
- 4. AT THE END OF EACH DAY, THE CONTRACTOR SHALL CLEAN UP THE PROJECT AREA AND LEAVE IT IN A NEAT AND SECURED MANNER. UPON COMPLETION, THE CONTRACTOR SHALL LEAVE THE PROJECT AREA FREE OF DEBRIS AND UNUSED MATERIAL.
- 5. IF EXISTING CONCRETE CURBS AND SIDEWALKS DESIGNATED TO REMAIN ARE DAMAGED, THEY WILL BE REMOVED AND REPLACED TO ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
- 6. CONTRACTOR TO COORDINATE UTILITY RELOCATIONS WITH CLARK PUBLIC UTILITIES FOR POWER, CITY OF VANCOUVER FOR WATER AND SANITARY SEWER, QWEST FOR TELEPHONE, NW NATURAL FOR GAS, AND COMCAST FOR CABLE TV
- 8. CONTRACTOR SHALL PROTECT EXISTING UTILITIES AND SERVICE LINES. ALL DISTURBED UTILITY LINES SHALL BE REPAIRED AS DIRECTED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF EXISTING UTILITY LINES OR STRUCTURES DESTROYED THROUGH NEGLIGENCE AND/OR INATTENTION.
- 9. CONTRACTOR TO MAINTAIN INGRESS AND EGRESS FROM ALL PRIVATE PROPERTY DRIVEWAYS THROUGHOUT THE DURATION OF CONSTRUCTION.

PHASING AND STAGING NOTES

- 1. ANY PHASING, STAGING AND CONTROL OF WATER ARRANGEMENTS SHOWN ON THE PLANS ARE CONCEPTUAL ONLY. THE CONTRACTOR SHALL PROVIDE A DETAILED PHASING AND STAGING PLAN FOR REVIEW AND APPROVAL. THE CONTRACTOR MAY USE THIS PLAN SET AS A BASIS BUT IT CANNOT BE ADOPTED WITHOUT ADDITIONAL DETAIL AND NOTES (SEE SPECIAL PROVISIONS).
- 2. THE CONTRACTOR'S PLAN AND ALL PHASES OF WORK SHALL COMPLY WITH ALL PERMITS AND PERMIT CONDITIONS AT ALL TIMES. SEE THE PERMIT SUMMARY SECTION OF THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
- 3. THE CONTRACTOR SHALL FINISH GRADE AND SEED ALL DISTURBED AREAS WITHIN (7) SEVEN DAYS OF INITIAL DISTURBANCE BETWEEN MAY 1 AND SEPTEMBER 20 AND WITHIN (2) TWO DAYS BETWEEN OCT 1 AND APRIL 30. NO EXCEPTIONS WILL BE PERMITTED.
- 4. THE CONTRACTOR'S HAUL VEHICLES SHALL NOT EXCEED A SPEED LIMIT OF 20 MPH IN ANY SUBDIVISION, SUBJECT TO A FINE OF \$100 FOR EACH OCCURENCE WITH NO AGGREGATE
- 5. CONTRACTOR SHALL BE RESPONSIBLE FOR STABILIZING, SEEDING AND MULCHING OF ALL DISTURBED AREAS IN ACCORDANCE WITH ALL PERMIT CONDITIONS. ADDITIONAL PLANTING (BY OTHERS) WILL BE COMPLETED FOLLOWING COMPLETION OF CONSTRUCTION.

LEGEND



SYMBOLS

	<u></u>		
Ш	NEW CATCH BASIN (CB)		EXISTING CURB INLET (CI) EXISTING CATCH BASIN (CB)
	NEW MANHOLE (MH)	\bigcirc	EXISTING STORM MH
	NEW CURB INLET (CI)	Ŏ	EXISTING MISC MH
=	NEW COMBINATION CURB INLET (CCI)	*	EXISTING SHRUB
D _{MB}	NEW MAIL BOX	X	EXISTING CONIFEROUS TREE
(NEW HANDICAP RAMP	유	EXISTING DECIDUOUS TREE
		_	EXISTING SIGN
(C100)	CURVE TABLE	\odot	EXISTING DECIDUOUS TREE
\Leftrightarrow	EXISTING TRANSFORMER		EXISTING J BOX
\boxtimes	EXISTING ELEC TOWER	(Ī)	EXISTING TELEPHONE MANHOLE
\mathbb{O}_{SAN}	EXISTING SANITARY SEWER MH	-	EXISTING TELEPHONE POLE
Q	EXISTING FIRE HYDRANT	☆	EXISTING LIGHT
O _{CL}	EXISTING CLEAN OUT	G	EXISTING GUY ANCHOR
-₩-	EXISTING GAS VALVE	- O-	EXISTING POWER POLE
\ominus	EXISTING WATER METER	m.	
-W-	EXISTING WATER VALVE	□ _{MB}	EXISTING MAIL BOX
¤	EXISTING SIGNAL POLE		EXISTING TELEPHONE PEDESTAL
	EXISTING TELEPHONE VAULT	⊙ ^	EXISTING SPRINKLER HEAD
ΕV	EXISTING TELEVISION BOX	\triangle	TRAVERSE POINT
③	EXISTING WELL	\otimes	TEST HOLE
برسي	EXISTING BRUSH LINE		

COCOCO EXISTING HEDGE





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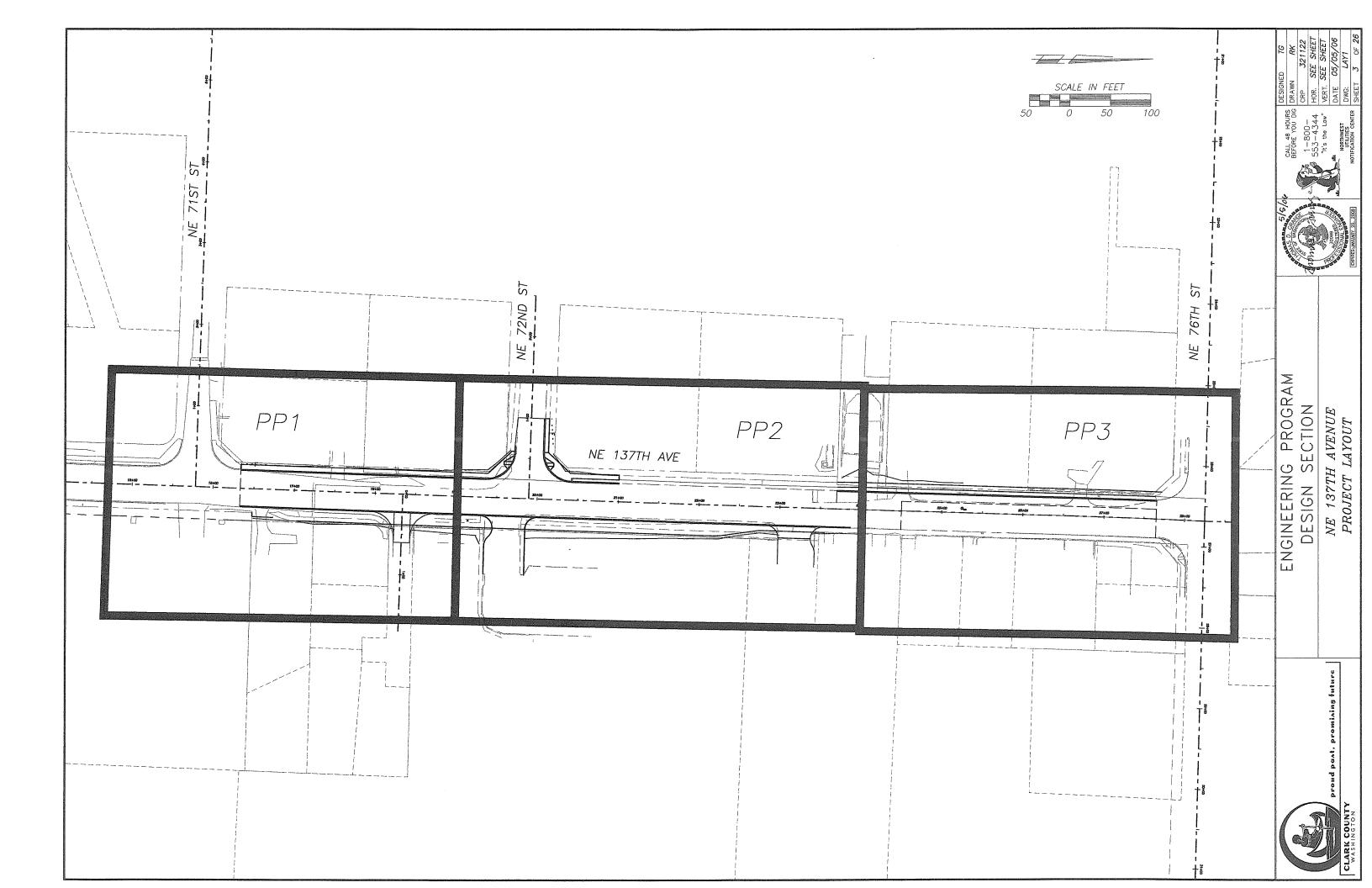
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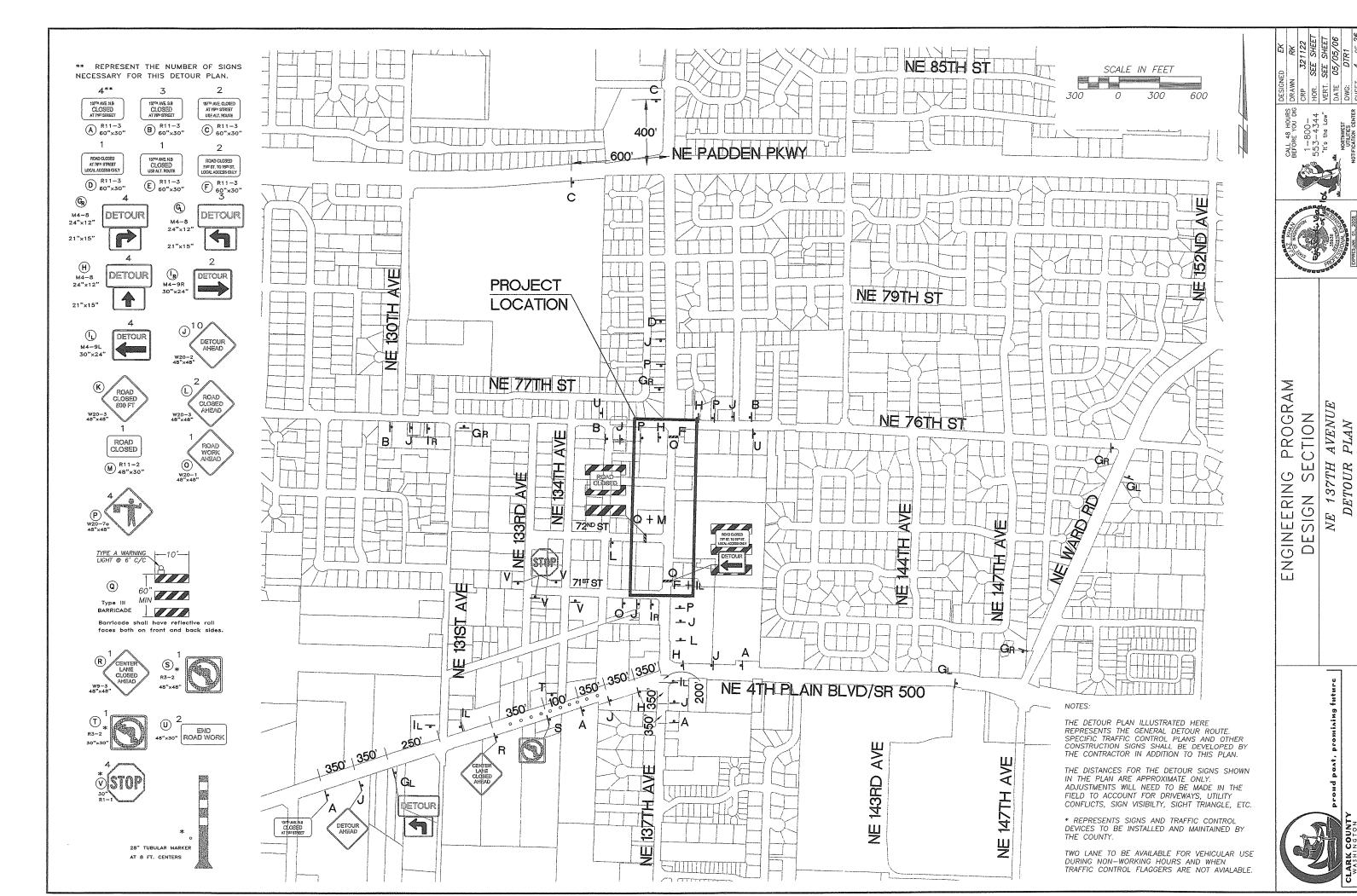
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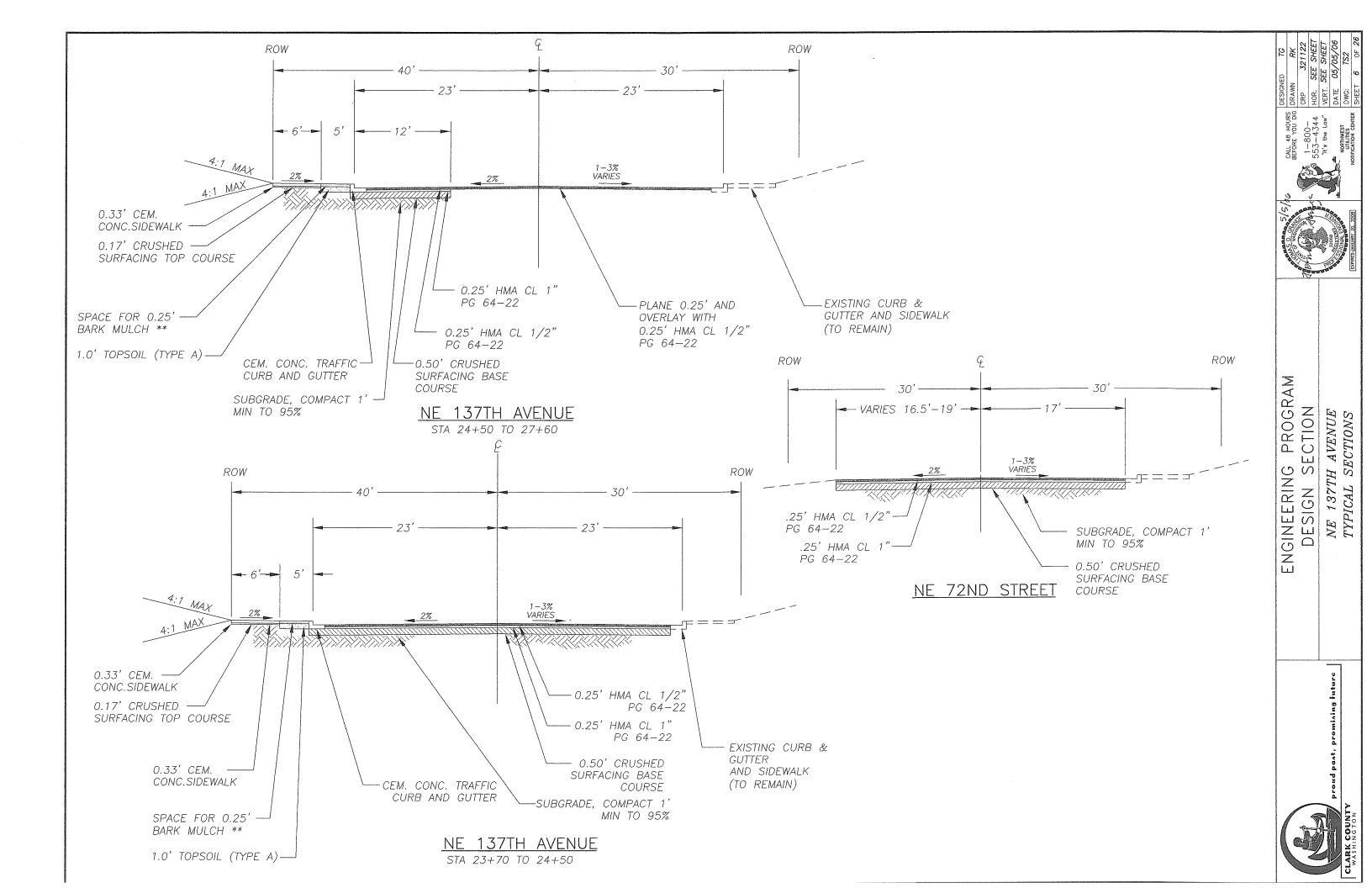
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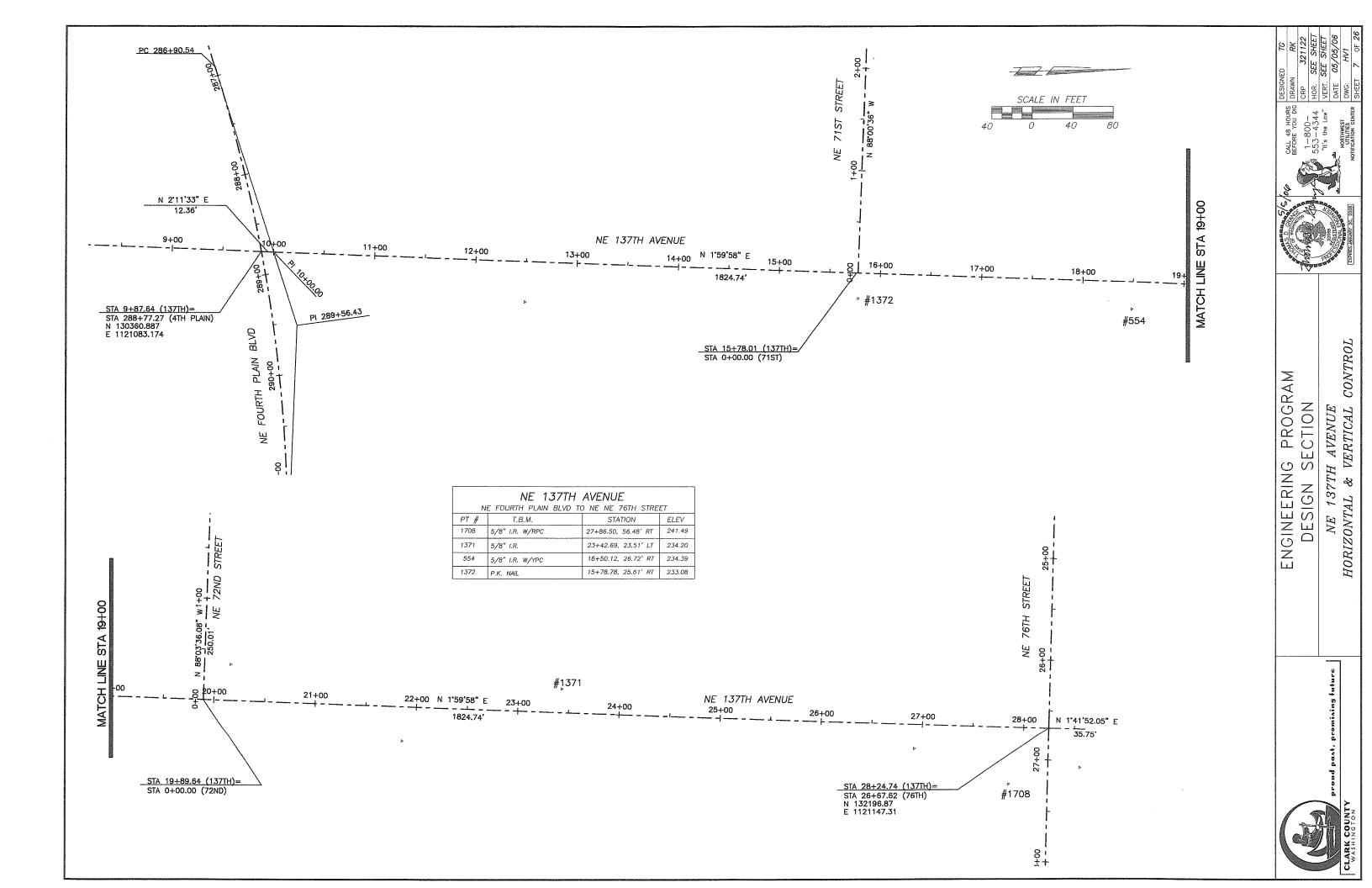
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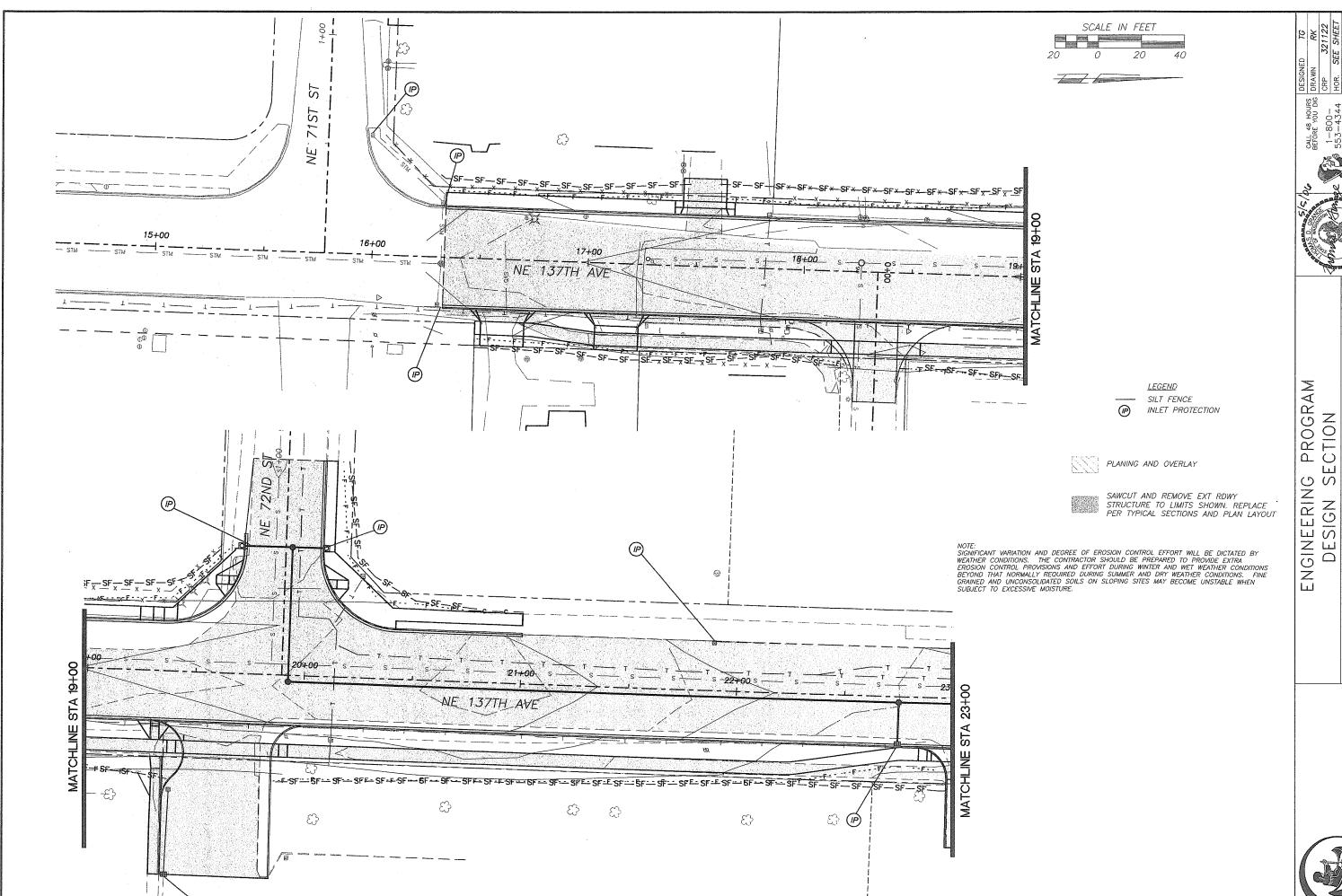
TYPICAL SECTIONS

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CLARK COUNTY WASHINGTON

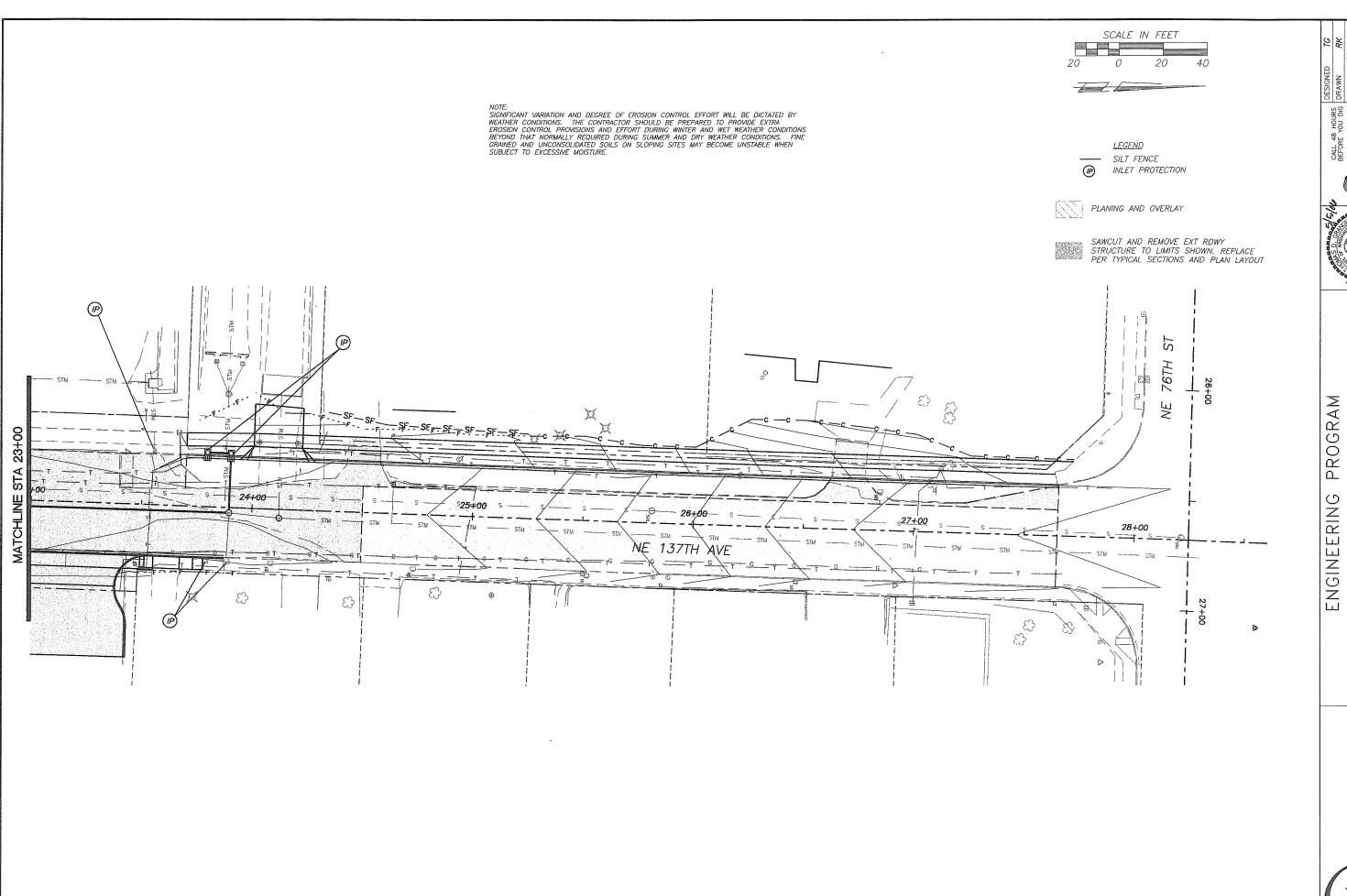






PLANREMOVAL

NE 137TH AVENUE EROSION CONTROL & ROADWAY F



ENGINEERING PROGRAM DESIGN SECTION

NE 137TH AVENUE EROSION CONTROL & ROADWAY REMOVAL

GINEERING PROGRAM DESIGN SECTION

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NE 137TH AVENUE
EROSION CONTROL DETAILS

STANDARD NOTES FOR EROSION CONTROL PLAN

 The Contractor shall install and maintain BMP's as shown and perform all actions necessary to prevent erosion, and control sediment from leaving the construction site. Site Contractor shall comply with Clark County Code Chapter 40.380.050.

2. All erosion control measures shall be in-place and in working condition prior to disturbing and exposing any soil surfaces (i.e. silt fence, construction entrance, sedimentation barriers, sedimentation traps).

3. All erosion prevention and control BMP's shall be maintained and repaired as needed to insure continued performance of their intended function. Needed repairs shall be made as soon as practicable. They are to remain in place and operational during all phases of construction. Construction activities shall not continue or resume until repairs to erosion control facilities are made and the facilities are functional. Any sediment leaving the site or discharging to a sensitive area shall be stopped and controlled immediately. Contaminated areas shall be cleaned and restored.

 $4.\,$ Clearing limits and work area limits shall be delineated and marked. Do not disturb more area than needed for construction requirements.

5. All sensitive or critical areas (wetlands, steep slopes, natural waterways), and buffers shall all be clearly delineated and clearly marked, and protected from sediment deposition 6. Sediment laden runoff shall be prevented from entering all existing storm water catch basins and inlets affected by construction.

7. No exposed, bare soils shall remain unstabilized for more than two days during the period October 1 thru April 30 or for more than seven days during the period of May 1 through September 30. All disturbed soil surfaces shall be stabilized by a suitable application of "Best Management Practices".

8. Where feasible, no more than 500 feet of trench shall be open at one time. Excavated material shall be placed on the up—hill side of trenches provided it does not conflict with safety requirements.

Dewatering devices shall discharge into a sediment trap or sediment pond. No discharge shall be made to a paved street or stormwater collection system without first removing sediment.

10. Cut and fill slopes shall be constructed in a manner that will minimize erosion. Erosion shall be controlled and prevented by such measures as roughening the surface, installation of interceptor ditches, terracing, covering with matting, mulch or plastic sheeting. Runoff shall be prevented from entering a slope and from undercutting the base of slopes.

11. Any soil or debris transported onto roadways and sidewalks shall be removed. Deposits shall be completely removed by shoveling and/or sweeping. Washing shall not be utilized unless specifically approved in writing by the County.

12. All permanent infiltration systems shall be isolated and protected from sediment laden runoff entering to avoid risk of reducing the ability of the systems to infiltrate. Isolation and protection shall not be removed until the drainage area tributary to the system is completely stabilized.



13. All conveyance channels, both temporary and permanent shall be stabilized to prevent erosion of the channel. Stabilization shall extend to areas at outlets and downstream reaches vulnerable to erosion resulting from flow discharging from the channel.

14. If BMP's shown are utilized but are insufficient to prevent sediment from reaching water bodies, adjacent properties, or public rights—of—way; additional BMP's shall be implemented immediately to prevent further encroachment of sediment.

15. Stabilized areas shall be provided for employee parking and storage of construction materials. Erodeable stockpiles of earthen materials, such as topsoil, silty and clayey soils; and landscape materials, shall be covered when not being incorporated in the work. Erosion control BMP's shall be utilized as necessary to prevent sediment laden runoff from leaving or sediment being transported from these areas from vehicle activity.

16. All pollutants other than sediment that occur during construction shall be handled and disposed of in a manner that does not cause contamination of storm water.

17. The Contractor shall keep an inspection log of the condition of the erosion control facilities. Erosion control facilities shall be inspected at least weekly and after each rainfall. The inspection log shall be kept at the project site at a designated location and shall be avoilable for review by the County. An individual that has successfully completed the County's Erosion Control Certification course shall perform inspections and maintain the

18. All temporary BMP's shall be removed within 30 days after final site stabilization is achieved. Trapped sediment shall be deposited and stabilized on site. Areas disturbed resulting from removal shall be permanently stabilized.

19. Construction shall not be considered complete and acceptable until all disturbed sail surfaces have been protected from erosion with permanent landscaping, covering with impervious surfaces, restored to original undisturbed condition or permanently stabilized.

20. Vegetated stabilization and landscaping shall be fertilized, watered and maintained to insure that growth of vegetation is established and sustained.

21. During dry weather construction periods the contractor shall provide project—specific dust control measures that may include: Seeding, Mulching, Matting, Water, Tackifier, or Chemical Soil Stabilizers. The contractor shall maintain the dust control measures through dry weather periods until all disturbed areas have been stabilized. Immediately re—stabilize areas disturbed by contractor's operations or other activities (wind, water, vandalism, etc.).

22. Entry onto the construction site shall be restricted to a single approved entrance as shown on the plan.

23. Maintenance and repair of heavy equipment and vehicles which involve potential contaminants (oii,solvents,hydraulic fluid, etc.) must be conducted in a manner which prevents contamination of soils, surface water and ground water. Tarps, drip pans, or other appropriate measures shall be used as necessary.

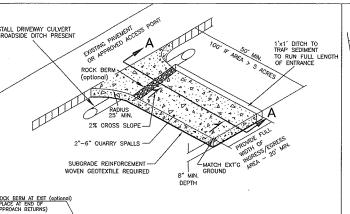
24. Stripping, topsoil, and unsuitable material stockpiles shall be hydroseeded with "regreen wheat x wheat grass hybrid" by Hobbs and Hobkins (or approved equal). Maintenance of stockpile areas and reapplication of hydroseed covering shall be required if bare soil is present. During winter and wet weather conditions, stockpiles shall be covered with plastic sheeting per detail E-16.

SHEET 2 OF 2

SHEET 2 OF 2

Sheeting per detail E-16.

Sheeting per detail E



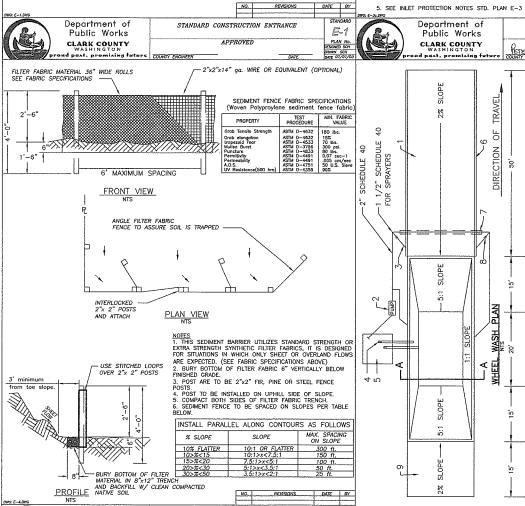
ROCK BERM AT EXIT (optional) (FLACE AT END OF APPROACH RETURNS) FINISHED ROAD MIN MIN MIN DES SPALS SPALS 1. EXCAVATE MINIMUM OF 12" OF EXISTING SOILS. 2. PLACE MINIMUM OF 12" OF EXISTING SOILS. 3. CONSTRUCT ROCK BERM ALON: TRANSMOM POINT FINISH ROAD SURFACES, DIVERT RUNOFF TO ONSIT MOVEN GEOTEXTILE REQUIRED

NOTES:

1. INSTALL WOVEN GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PLIMPING

SECTION A-A

- VEHICLE WASHDOWN AREA, IF REQUIRED, IS TO BE INSTALLED AND USED TO REMOVE SEDIMENT FROM VEHICLES THAT ARE ABOUT TO ENTER AN ESTABLISHED ROAD.
- WASHDOWN AREA TO BE MADE UP OF CLEAN 2"- 6" QUARRY SPALLS, 1" DEEP (MIN) OVER WOVEN GEOTEXTILE FABRIC. WASHDOWN AREA TO BE FULL WIDTH OF ENTRANCE AND 50" (MIN.), AND 100" IF EXPOSED SOIL IS OVER 5 ACRES.
- 4. THE RESPONSIBLE EROSION CONTROL INDIVIDUAL IS TO ENSURE THAT ALL VEHICLES USE THIS ENTRANCE AND ARE TO BE INSPECTED AND CLEANED OF SOILS BEFORE LEAVING PROJECT, AND THAT THE ENTRANCE IS TO BE KEPT CLEAN AT ALL TIMES.



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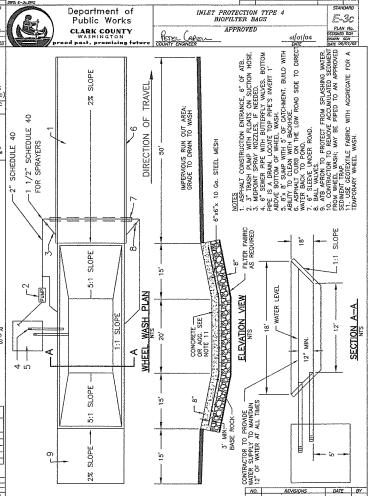
Public Works

CLARK COUNTY WASHINGTON

Department of

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E-15

CATCH BASIN

PLAN VIEW

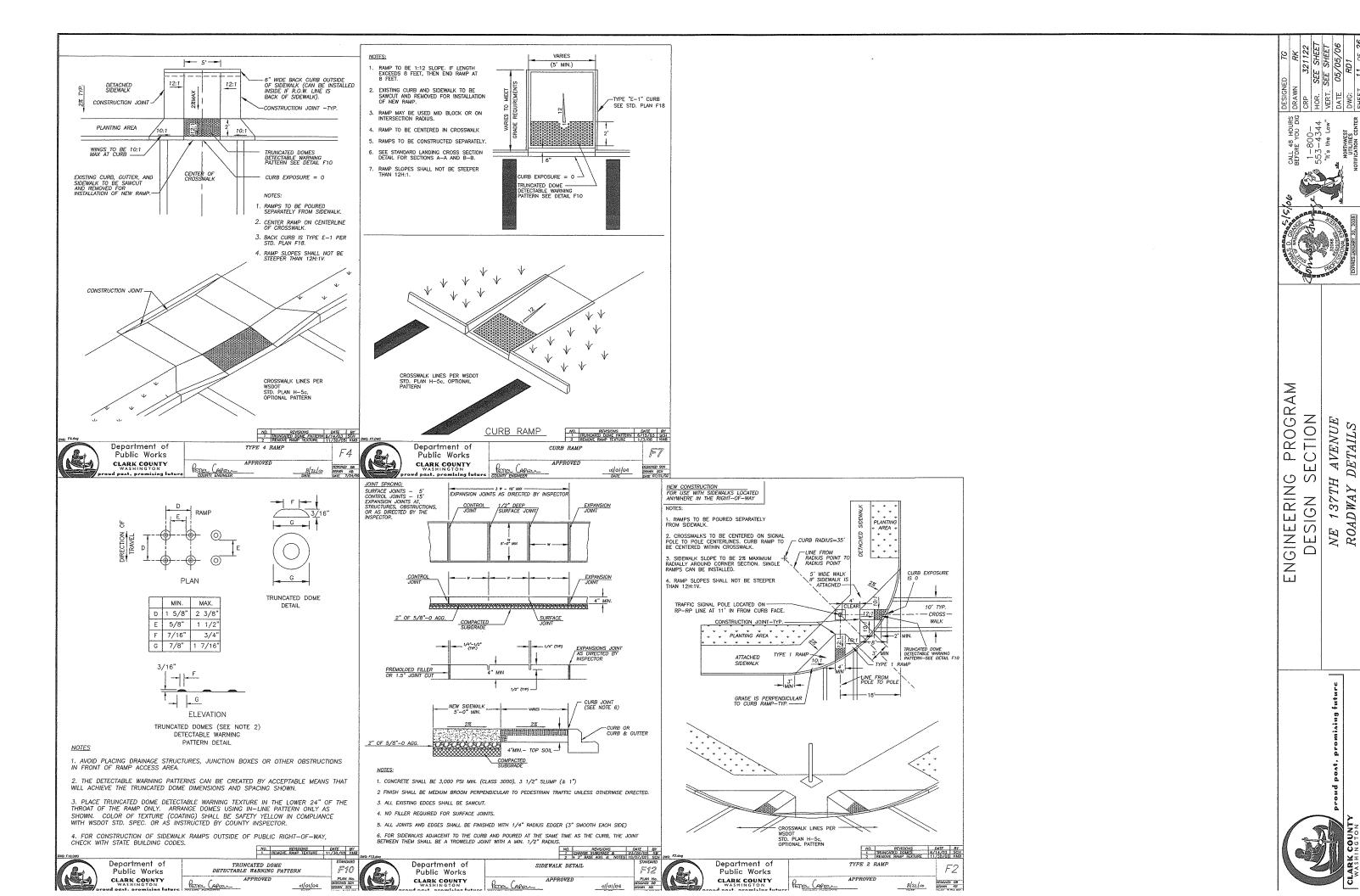
DITCH INLET

2. BIO-FILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1"x2" WOODEN STAKES OR APPROVED EQUAL PER BAG.

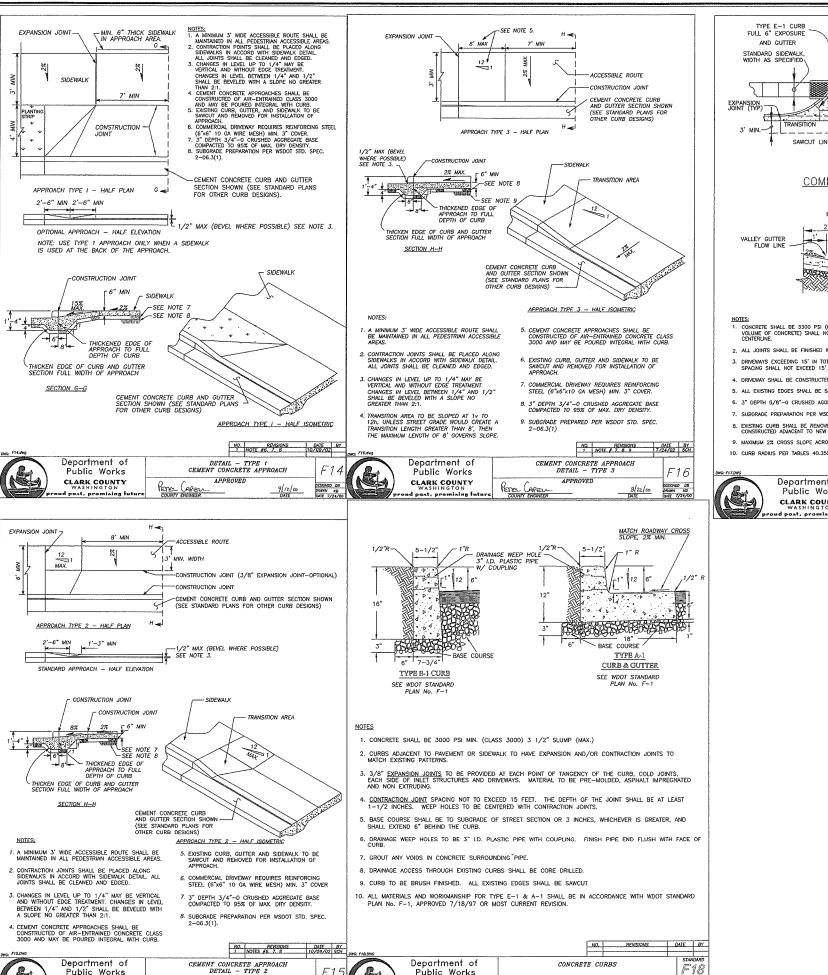
3. STRAW WATTLES MUST BE STABILIZED BY ATTACHING WIRE CLIPS TO THE CATCH BASIN PER MANUFACTURES SPECIFICATIONS

4. INLET PROTECTION MUST BE REGULARLY INSPECTED BY THE EROSION CONTROL INDIVIDUAL TO INSURE PROPER PLACEMENT/FUNCTION AND MAINTENANCE.

1. ADDITIONAL MEASURES MUST BE CONSIDERED DEPENDING ON SOIL TYPE.



DETAILS



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CLARK COUNTY

Public Works

CONCRETE CURBS

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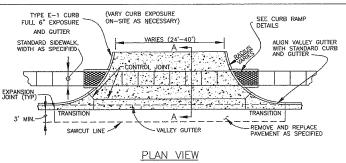
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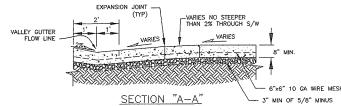
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CLARK COUNTY



COMMERCIAL DRIVEWAY ENTRANCE



CONCRETE SHALL BE 3300 PSI (MIM. BREAKING STRENCTH © 28 DAYS) WITH 3" SLUMP (±1"). TOTAL AIR CONTENT (% BY VOLUME OF CONCRETE) SHALL NOT BE LESS THAN 4% OR MORE THAN 7%. MEDIUM BROOM FINISH PARALLEL TO DRIVEWAY CENTERLINE.

- 2. ALL JOINTS SHALL BE FINISHED WITH 1/4" RADIUS EDGE UNLESS OTHERWISE NOTED
- DRIVEWAYS EXCEEDING 15' IN TOTAL WIDTH SHALL HAVE ADDITIONAL LONGITUDINAL JOINTS AS DIRECTED. CONTROL JOINT SPACING SHALL NOT EXCEED 15'.
- 4. DRIVEWAY SHALL BE CONSTRUCTED WITH REINFORCING STEEL (6x6 10 GA WIRE MESH), MIN. 3" COVER.
- 6. 3" DEPTH 5/8"-0 CRUSHED AGGREGATE BASE COMPACTED TO 95% OF MAX. DRY DENSITY.
- 7. SUBGRADE PREPARATION PER WSDOT STD. SPEC. 2-06.3(1).
- EXISTING CURB SHALL BE REMOVED TO EXISTING JOINT OR SAWCUT SUCH THAT 3' MIN. OF NEW STREET SECTION IS CONSTRUCTED ADJACENT TO NEW DRIVEWAY.
- 9. MAXIMUM 2% CROSS SLOPE ACROSS PEDESTRIAN CROSSING.
- 10. CURB RADIUS PER TABLES 40.350.030-2 THRU 6, OR AS APPROVED BY COUNTY ENGINEER



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SURFACING: 1. All AC.P. shall be saw cut to provide a straight, clean edge prior to poving.
2. The cut line shall be one continuous straight line from the outer excavation limits of manhole, valve box, etc. to manhole, valve box, etc.
3. Pove with an 0.5 ft. minimum compacted depth AC.P., or match existing or design

section, whichever is greater.

Litts for AcP, Class A) shall be 0.15 ft. minimum and 0.35 ft. maximum for non-surface lifts (0.25 maximum for surface lift), the temperature shall be 250 degree minimum, 350 degree maximum, compocied to 92% of the theoretical maximum.

All joints shall be tacked, sealed and sanded.

Trench shall be ploted until poved.

For longitudinal installation, full lane width including turn lanes restaration shall be required or as directed by Clark County. For transverse installation refer to surfacing restaration of detail U6. See Section 12.20A.120.C.

BASE COURSE:

0.90 ft. minimum depth (1-1/4" minus) C.S.B.C. (W.S.D.O.T. approved material). Compacted to 95% of maximum density. See tranch zone. Equivalent depth of A.T.B. may be substituted.

For transverse or diagonal trenches in existing roadway povernent, CDF (as defined in the standard specifications section 2-09.3(1)E) will be used for a minimum of 3' in depth or from 6' above the top of the pipe to the bottom of full povernent section which ever is less.

TRENCH ZONE:

- Granular backfill as approved by local agency or W.S.D.O.T. specifications for granular backfill. Compacted to 95% of maximum density in the trench zone using Method C compaction as per Section 2-0.3 (14-b).
 Native material may be used if approved prior to construction by Clark County.

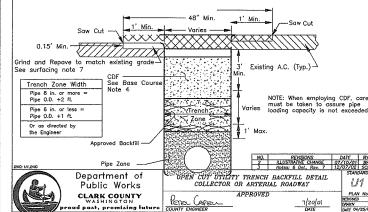
3. Trench zone width -- see below

PIPE ZONE:

Pipe zone material as specified by utility owner, and shall conform to section 9-03.12(3) WSDOT Specs
 1.0 ft. max. from top of the pipe.
 6" from top of pipe when CDF backfill used.

CONDITIONS: If the permit and requirements shall be on the job site at all times 2. The permit holder shall be responsible for all restoration and maintenance of

ผิดปกตรีสุรโลกติดและของ สมารัติสินารัสสุรโลกสระหล่างกลังจะปลายเราะ prior to commencing work.



ROADWAY SHOULDER INCLUDES LAWN AND LANDSCAPE

SHOULDER ROCK:

1. 0.50 ft. minimum depth (1 1/4" minus) crushed rock. (Clark County Approved Material).
2. Compacted to 95% of maximum density. See trench zone.
3. Rock shall extend from E.O.P. to the back of trench at approx. .05 Ft./Ft. slope.

LAWN & LANDSCAPE AREAS:

A County approved top soil shall be placed 0.50 Ft. in depth.
 Area to be restored to match existing.

Where the distance from E.O.T. to E.O.P. is less than or equal to the depth of the trench; these conditions shall apply:

Granular backfill as approved by local agency or W.S.D.O.T. specifications for granular backfill. Compacted to 95% of maximum density in the trench zone using Method C compaction as per Section 2-03.3 (14)C.

Native material may be used if approved prior to constru

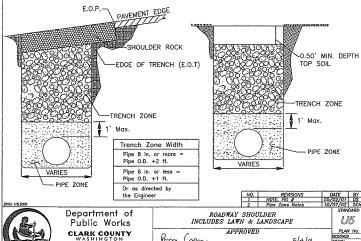
3. Trench zone width -- see below.

4. Shoulder rock ar landscaped sections as applicable

1. Pipe zone material as specified by utility owner, and shall conform to section 9-03.12(3) WSDOT Specs. 2. 1.0 ft. max. from top of the pipe.

A copy of the permit and requirements shall be on the job site at all times
 The permit holder shall be responsible for all restoration and maintence of ditches, shoulders, driveways, landscoping, ect.

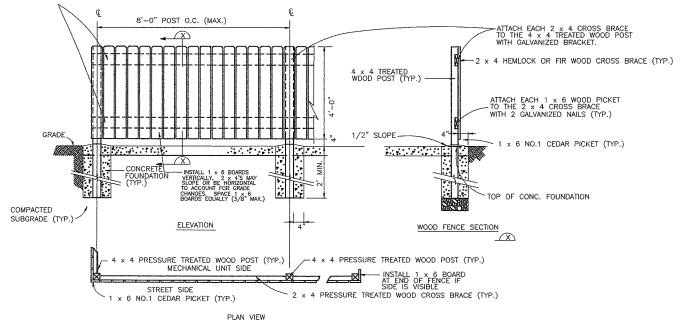
3. Call Clark County at 397-2446 twenty-four hours prior to commencing work



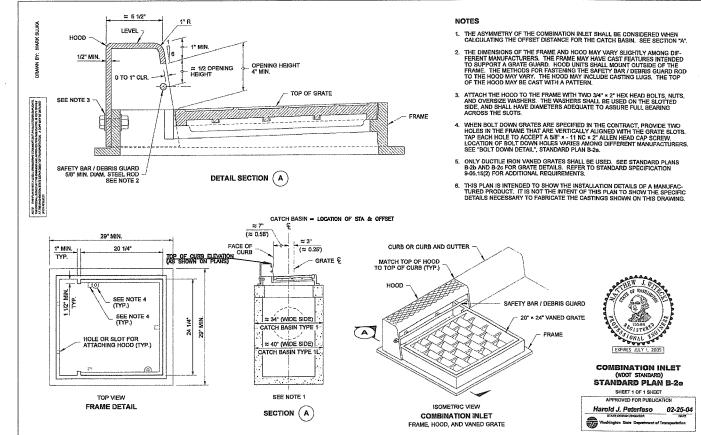
FENCE POST COMMERCIAL CONCRETE

MOWING STRIP

THE TOP AND BOTTOM WOOD CROSS BRACES SHALL BE PLACED 6" FROM THE END OF THE WOOD PICKETS OR MATCH EXISITNG FENCE.



WOOD FENCE DETAILS NTS



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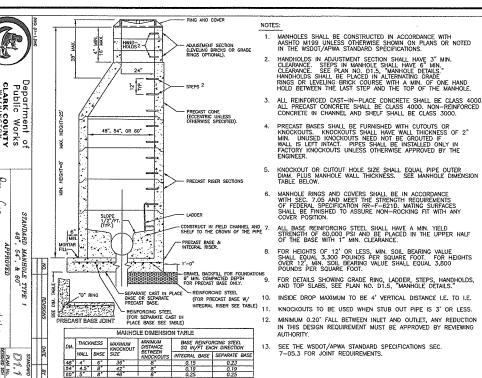
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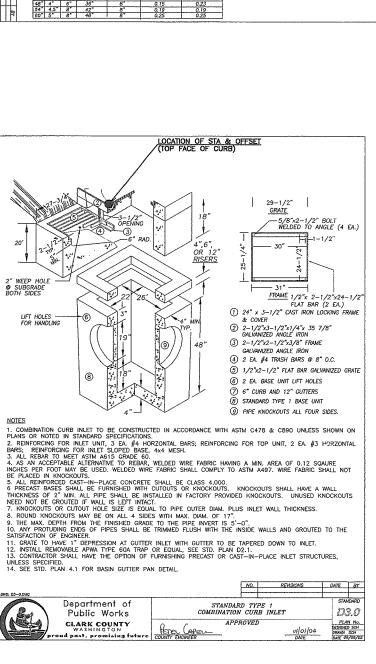
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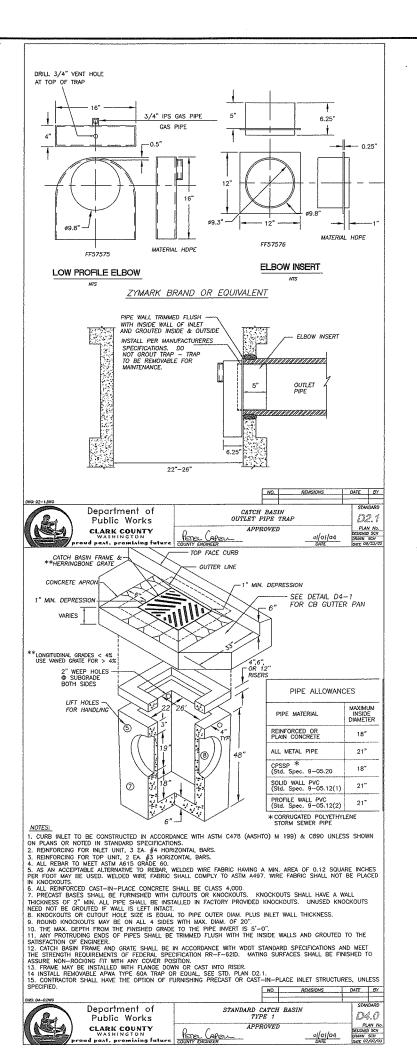
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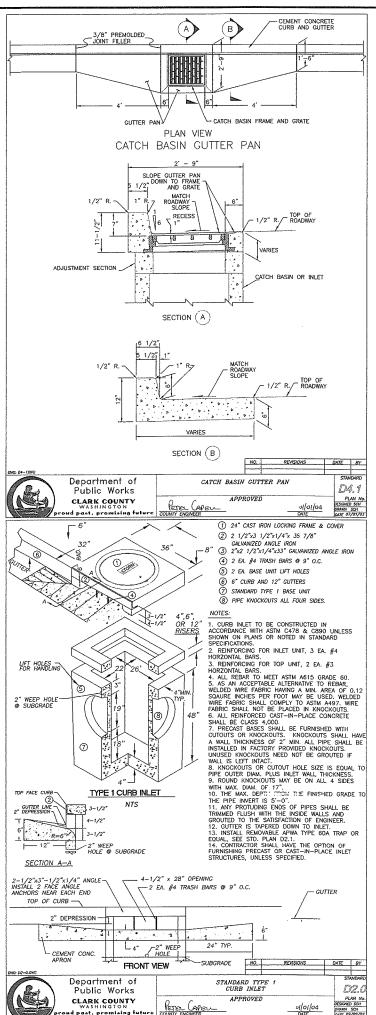
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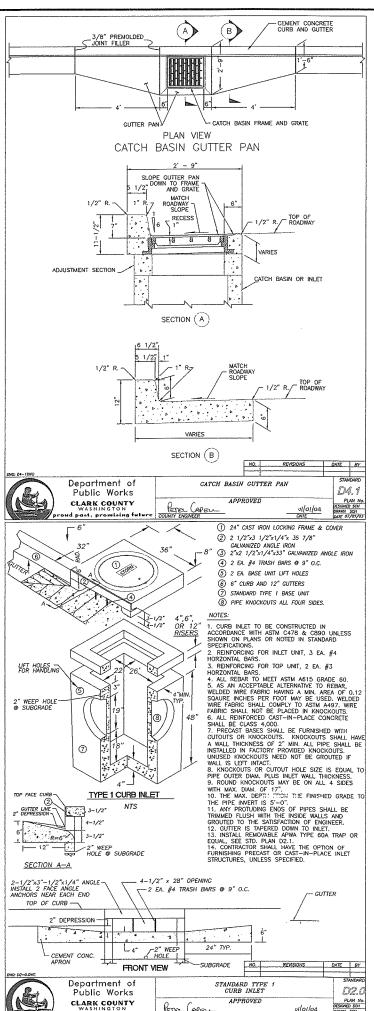
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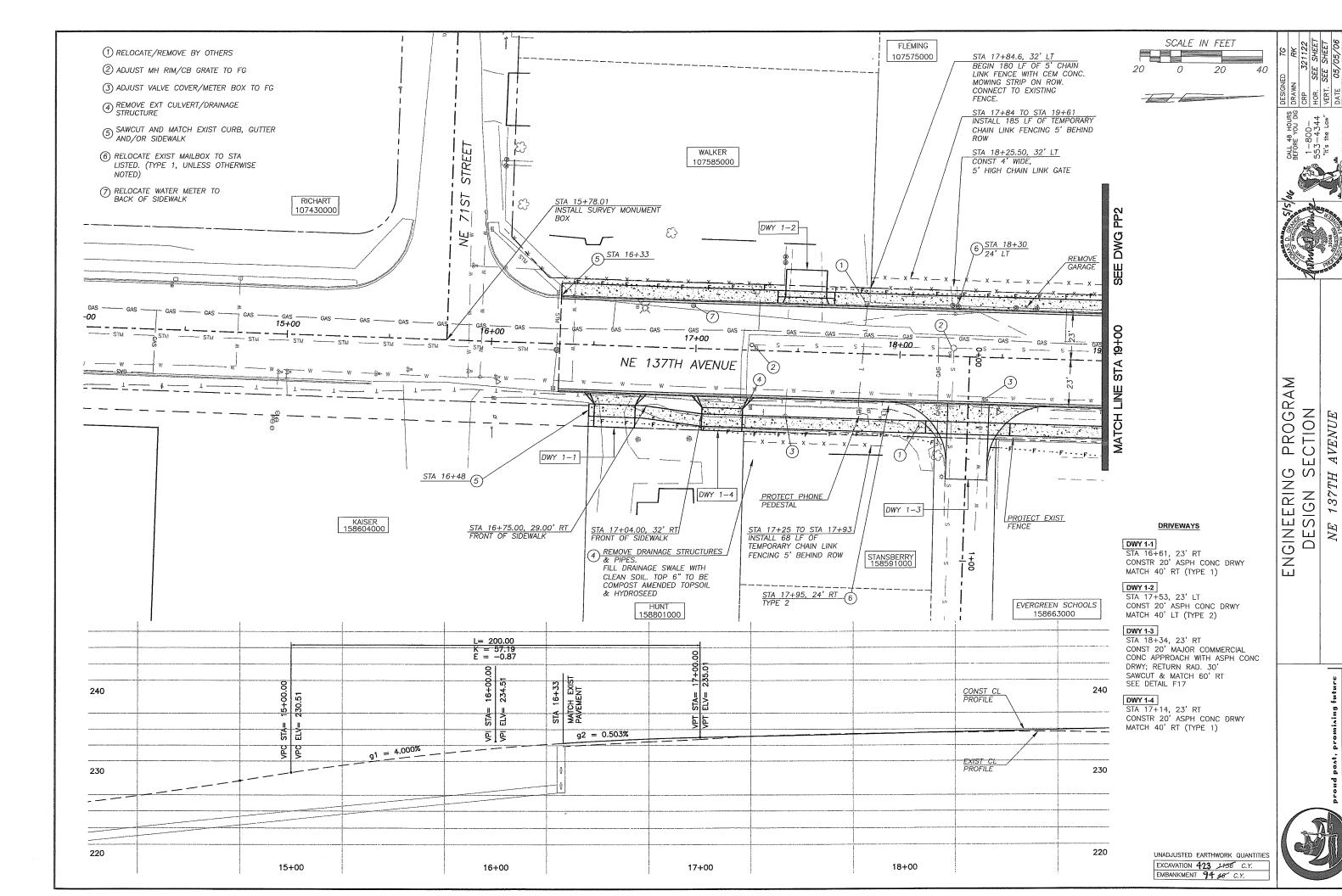
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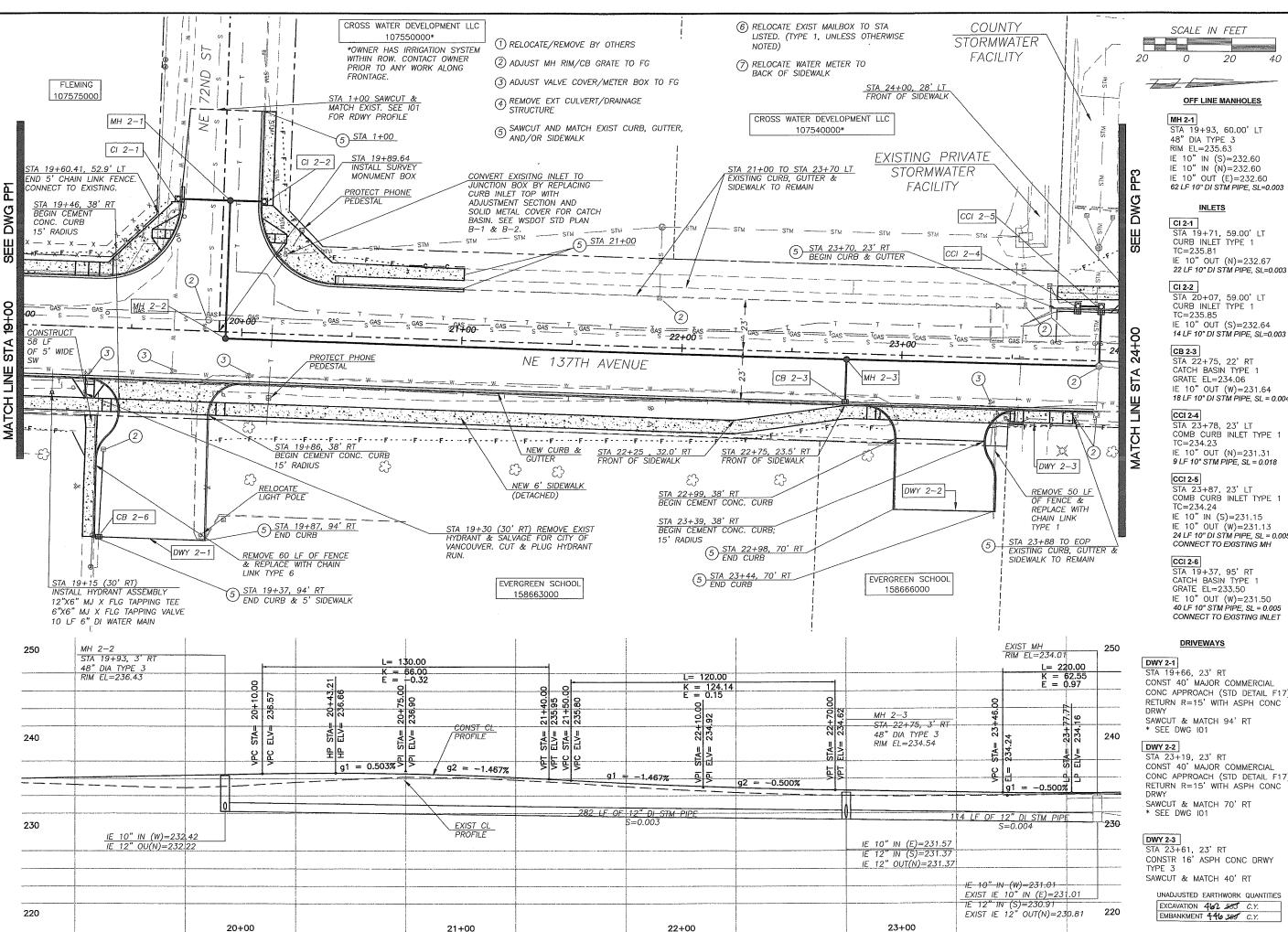
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INLETS

STA 19+71, 59.00' LT CURB INLET TYPE 1 TC=235.81 IE 10" OUT (N)=232.67 22 LF 10" DI STM PIPE, SL=0.003

STA 20+07, 59.00' LT CURB INLET TYPE 1 TC=235.85 IE 10" OUT (S)=232.64

CB 2-3 STA 22+75, 22' RT CATCH BASIN TYPE 1 GRATE EL=234.06 IE 10" OUT (W)=231.64 18 LF 10" DI STM PIPE, SL = 0.004

STA 23+78, 23' LT COMB CURB INLET TYPE 1 TC=234.23 IE 10" OUT (N)=231.31 9 LF 10" STM PIPE, SL = 0.018

CCI 2-5 STA 23+87, 23' LT COMB CURB INLET TYPE 1 TC=234.24 IE 10" IN (S)=231.15 IE 10" OUT (W)=231.13 24 LF 10" DI STM PIPE, SL = 0.005 CONNECT TO EXISTING MH

CCI 2-6 STA 19+37, 95' RT CATCH BASIN TYPE 1 GRATE EL=233.50 IE 10" OUT (W)=231.50 40 LF 10" STM PIPE, SL = 0.005 CONNECT TO EXISTING INLET

DRIVEWAYS

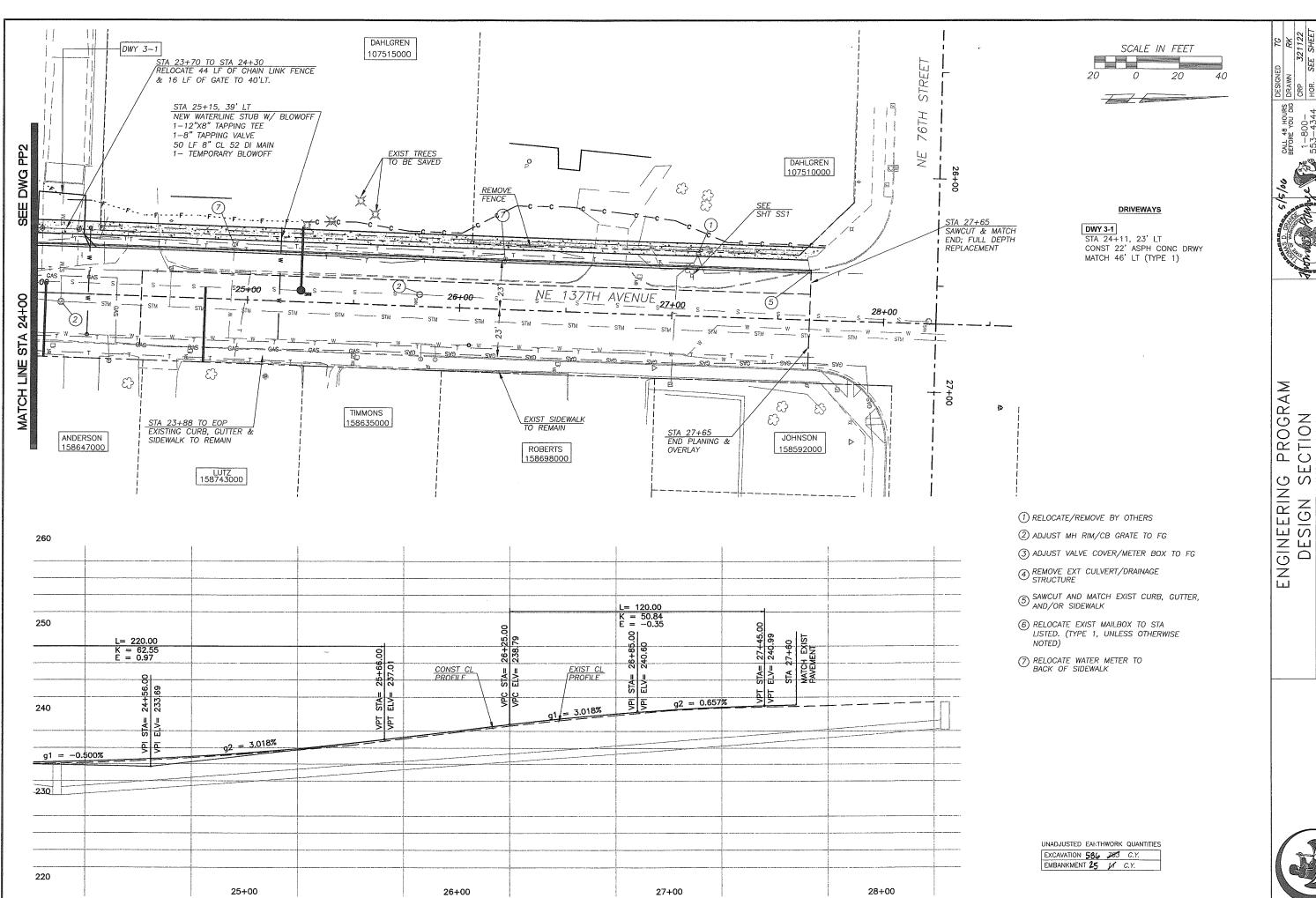
STA 19+66, 23' RT CONST 40' MAJOR COMMERCIAL CONC APPROACH (STD DETAIL F17) RETURN R=15' WITH ASPH CONC SAWCUT & MATCH 94' RT

STA 23+19, 23' RT CONST 40' MAJOR COMMERCIAL CONC APPROACH (STD DETAIL F17) RETURN R=15' WITH ASPH CONC

SAWCUT & MATCH 70' RT * SEE DWG 101

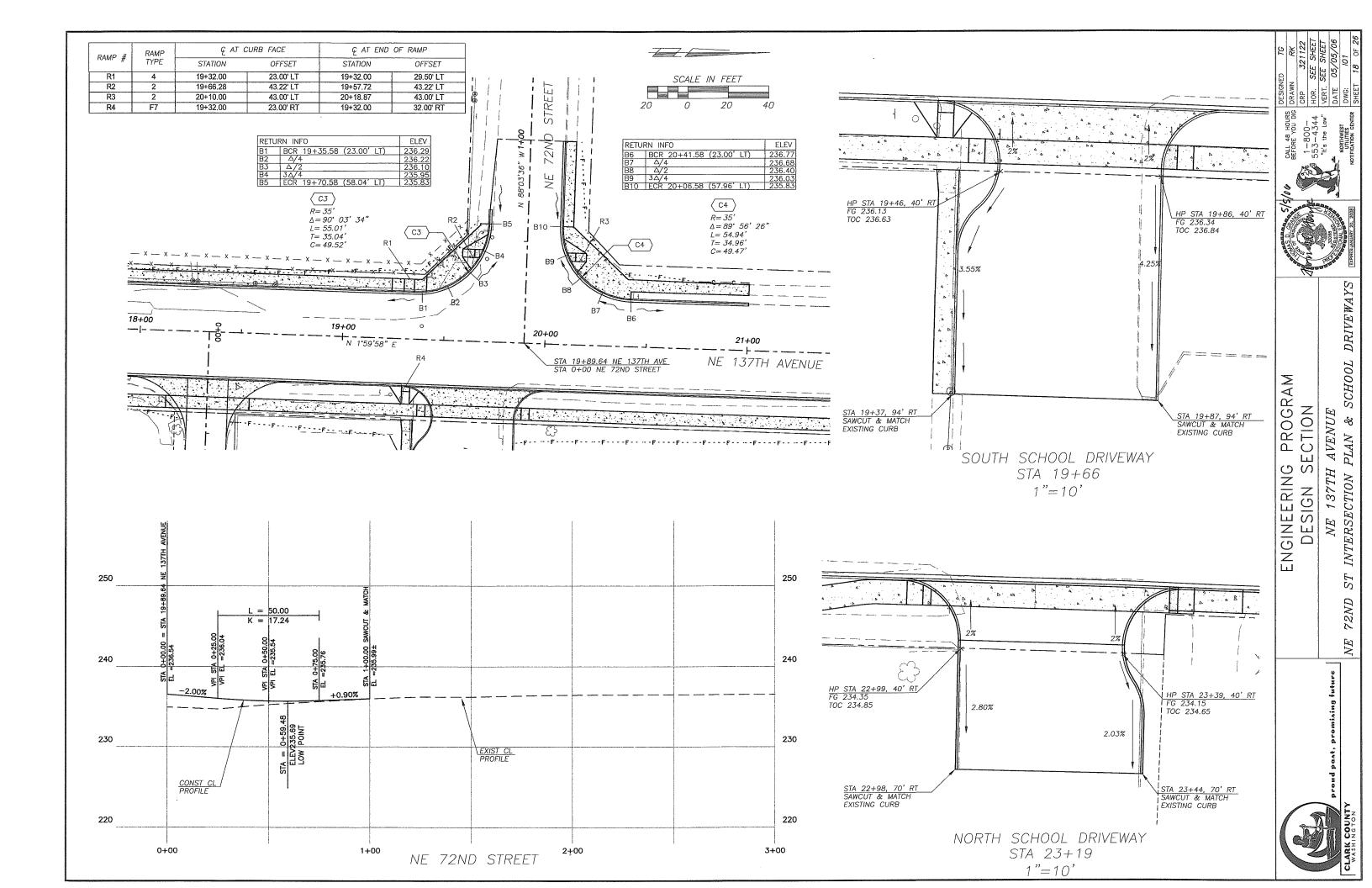
STA 23+61, 23' RT CONSTR 16' ASPH CONC DRWY SAWCUT & MATCH 40' RT

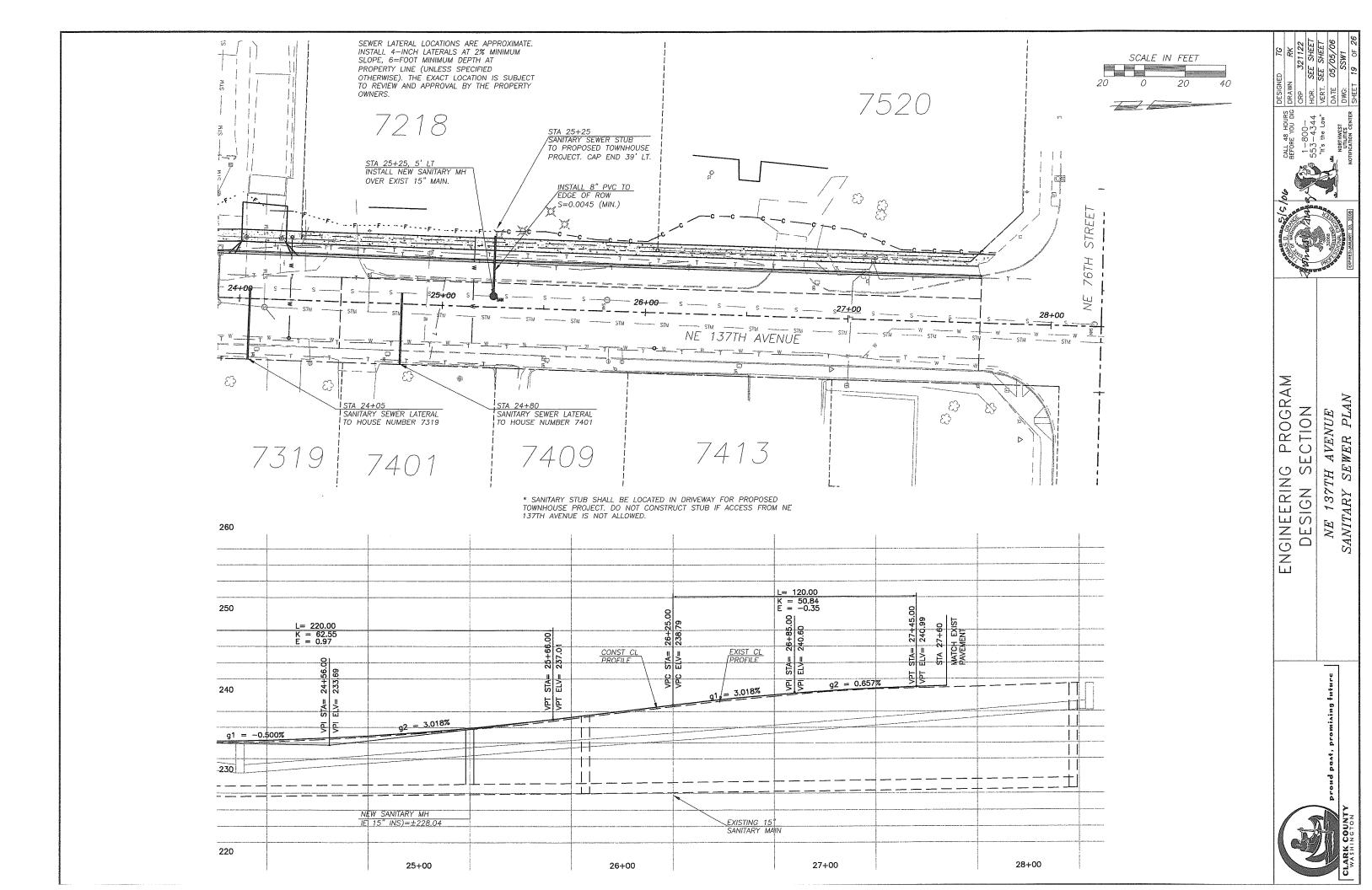
UNADJUSTED EARTHWORK QUANTITIES EXCAVATION 462 553 C.Y.



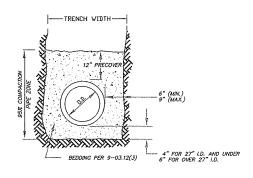
E.O.P. T0

24+00 AVENUE(STA)137TH PROFILE NE





STANDARD PIPE BEDDING (FLEXIBLE PIPE)



- BEDDING AND BACKFILL MATERIALS IN THE PIPE ZONE SHALL BE COMPACTED AS SPECIFIED FILLING THE REMAINDER OF THE TRENCH.
- FOR ROCK AND OTHER INCOMPRESSIBLE MATERIALS, THE TRENCH SHALL BE OVEREXCAVATED A M 6" AND REFILLED WITH GRANULAR MATERIALS AS DIRECTED BY THE ENGINEER.
- 4. BACK FILL AND COMPACTION ABOVE THE PIPE ZONE SHALL BE AS SHOWN IN STANDARD PLAN
- 5. INSTALLATION SHALL CONFORM TO UNIBELL PLASTIC PIPE ASSN. STANDARD SPEC. UNI-B-5 (LATEST EDITION) EXCEPT AS NOTED.
- 7. ALTERNATIVE PRE-COVER MATERIALS ARE ALLOWABLE FROM PIPE CENTERLINE TO ONE FOOT ABOVE THE TOP OF PIPE. ALTERNATE PRE-COVER MATERIALS MUST BE PREAPPROVED BY THE INSPECTOR AND MAY BE SAND, CRUSHER SCREENINGS, GRAVEL, OR OTHER CLEAN GRANULAR MATERIAL CONTAINING NO ROCK LARGER THAN 1-1/4" IN LENGTH.

EDGE OF EXISTING PAVENEN WHEN NOT OTHERMSE SPECITED RESURFACING SHALL CONSI OF 6" OF 0" OF 3/4" — O OR 3/4" — O CRUSHED AGGREGATE AS DIRECTED. GRANULAR BACKFILL AS DIRECTED EXECAVATION EXECAVATION NATIVE BACKFILL Zove \bigcirc ₁₂ 0, 0,1

(CONCRETE)

WHEN HOT OTHERWISS SPECIFIED, RESURFACO OF 3" OF CLASS "B' ON 9" OF 1-1/4" -CRUSHED AGGREGAT

(2 UFTS) (C----

GRANULAR BACKFILL AS DIRECTED

0

COLLECTOR OR LOCAL ST. OIL GRAVEL OR ASPHALT CONCRETE SURFACE

TRAVELED UNIMPROVED

WHEN NOT
OTHERWISE
SPECIFED,
RESURFACING
SHALL CONSIST
OF 5" OF
CLASS "B" MIX
ON 12" OF
L-1/4" - 0
CRUSHED
AGGREGATE.

STREET

GRAHULAR BACKFILL AS DIRECTED

0

MAIN OR SECONDARY ARTERIAL OIL GRAVEL OR ASPHALT

CONCRETE SURFACE

TYPICAL TRENCH SECTIONS: BACKFILL, BEDDING & SURFACING S-1.3 N.T.S.

 SEE CLARK COUNTY PERMIT FOR ADDITIONAL TRENCH BACKFILL AND SURFACING REQUIREMENTS IN COUNTY ROADS. MINIMUM AC. DEPTHS MAY BE REDUCED TO 0.3 FT. AND 0.2 FT. FOR ARTERIAL AND COLLECTOR STREETS, RESPECTIVELY, IN COUNTY ROADS. 0.35' MIN. A.C.

NOTES:

- FOR PIPE ZONE BEDDING, BACKFILL AND COMPACTION REQUIREMENTS, SEE STD. PLAN NO. S-1.1 (RIGID PIPE) OR STD. PLAN NO. S-1.2 (FLEXIBLE PIPE) COMPACTION PERCENTAGES REFER TO RELATIVE DRY DENSITY AS DETERMINED BY STANDARD PROCTOR (ASTM D 698).
- Contractor May Use up to 2-1/2" of 5/8"-0 or 3/4"-0 crushed aggregate in Lieu of 1-1/4"-0 Base Rock Under Surfacing for Leveling Course.

APPROVED 6" TEE, WYE OR COMMERCIAL

PAMREX WATER TIGHT

STANDARD

Ø

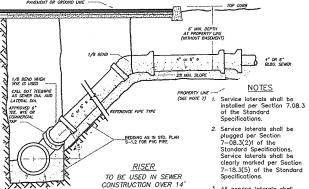
LOCKING

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WATERTIGHT

327 2017 2017 2017 2017

SERVICE LATERAL CONNECTIONS S-1.4 N.T.S



IN DEPTH

TYPICAL HOUSE BRANCH

STANDARD MANHOLE FRAMES & COVERS S-2.2 N.T.S.

5. All service laterals shall be a minimum of 6—inches in diameter, except for single family lots which may be 4—inch.

- 4. Approved commercial taps: Approved commercial taps:

 SEALTIGHT® TYPE "C" OR
 "D" SEWER SADDLE.

 FOWLER QUIK-WAY®
 SEWER TAP.

 FOWLER "T & L"®
 SEWER TEE.

 FOWLER "INSERTA TEE"

 "TAP—TITE"® SEWER TEE.
- Service laterals connecting to ductile iron pipe shall also be ductile iron.
- Transitions between dissimilar pipe materials or sizes shall be made with approved adaptors (Fernco, Caulder or equal).

JRS DIG žŠ

ANCOUVER WASHINGTON

SERVICES
NEERING
1995
A 98668-199 SEWER ENGINEER P. C. BOX 1995 ANCOLVER, WA 9868 (380) 582-583 FAX: (260) 582-583 WW.44,VAIDONWELLE IV.

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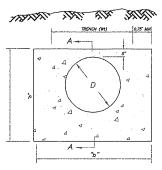
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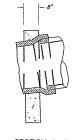
54 R 8

R & FRAME
UE BEARING ,
FRIAL SHALL ,
A.S.T.M. A--

STANDARD PLAN FOR ANCHOR WALLS

0





NOTES

HHERE DIRECTED BY THE ENGINEER GRANULAR TRENCH FOUNDATION STABILIZATION SHALL BE PLACED PRIOR TO PLACEMENT OF THE BEDDING, SIZE AND DEPTH ARE DEPENDENT ON SOIL CONDITIONS.

BEDDING AND BACKFILL MATERIALS IN THE PIPE ZONE SHALL BE COMPACTED AS SPECIFIED PRIOR TO BACKFILLING THE REMAINDER OF THE TRENCH.

BC = OUTSIDE DIAMETER
D = INSIDE DIAMETER
d = DEPTH OF BEDDING MATERIAL
BELOW PIPE

FOR ROCK AND OTHER INCOMPRESSIBLE
MATERIALS, THE TRENCH SHALL BE OVEREXCAVATED A MINIMUM OF 6" AND REFILLED WITH GRANULAR MATERIAL AS
DIRECTED BY THE ENGINEER.

DIRECTED BY THE ENGINEER.

ANTIVE MATERIAL MAY BE USED IN LIEU OF IMPORTED MATERIAL FOR BEDDING SPECIFIED, PROVIDED THAT THE HATTIE MATERIAL CONFORMS TO SECTION 9-03.19 OF THE STD. SECTION 9-03.19 OF THE CONTACTOR SHALL SUBMIT A SAMPLE OF THE NATURE MATERIAL TO THE ENGINEER AT LEASE 72 HOURS PRIOR TO USE THE ENGINEER MAY BAPPONE, RESECT OR REQUIRE LABORATORY TESTING OF THE MATERIAL PROPERTY OF THE MATER

BACKFILL AND COMPACTION ABOVE THE PIPE ZONE SHALL BE AS SHOWN IN STD. PLAN S-1.3

FOR FLEXIBLE PIPE BEDDING SEE STD. PLAN S-1.2

27" & SMALLER

DEPTH OF BEDDING
MATERIAL BELOW PIPE
D d (min) [3]

SECTION A-A

NOTES:

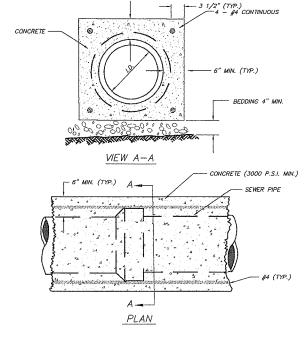
- ALL CONCRETE TO BE 3000 P.S.I., 2" TO 4" SLUMP
- 2. WALLS WILL BE PLACED WHERE GRADE IS 20% OR OVER.
- ANCHOR WALLS TO BE EQUALLY SPACED WITH MAXIMUM DISTANCE BETWEEN WALLS TO BE AS SHOWN IN TABLE "A".
- 4. PLACE WALL IMMEDIATELY BELOW BELL OF PIPE WHERE POSSIBLE.
- 5. CONCRETE SHALL BE POURED AGAINST FORMS OR STABLE UNDISTURBED SOIL.

		TABLE "A"
SLOF	E %	MAXIMUM ALLOWABLE SPACING (FT.)
OVER	то	(MEASURED ON SLOPE)
20	35	36*
35	50	24'
50	100	16'

	TAB	LE "B"		
PIPE SIZE (D)	TRENCH WIDTH MAX. (Wt)	h	ь	VOLUME OF CONCRETE (APPROX.
6", 8", 10"	2.5'	3.0'	4.0'	0.29 C.Y.
12", 15"	2.5'	4.0'	4.0'	0.37 C.Y.
18", 21", 24"	3.5'	4.0'	5.0'	0.42 C.Y.
30". 36"	4.5'	5.0'	6.0'	0.62 C.Y.

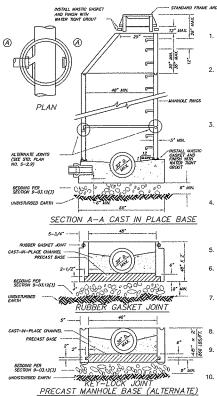
CONCRETE ENCASED SEWER PIPE S-1.6 N.T.S.

6" MIN. (TYP.)



1) SEPARATION BETWEEN WATER AND SEWER LINE AT CROSSING IS LESS THAN 18". 2) PIPE WILL BE LAID IN AN AREA WITH POTENTIAL FOR SETTLING SUCH AS IN A ROADWAY OR BELOW A STREAM.

STANDARD PRECAST MANHOLE 5-2.1



NOTES: All precast manhale rings and cones shall conform to ASTM C-478 with cast in steps. (Se Standard Plan No. S-2.3)

in over excavated areas, provide support for the pipe as follows: place 3/4" minus crushed rock over undisturbed ground in 6" layers and compact using hand tames"

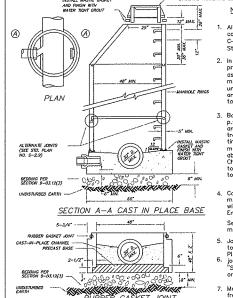
5. Base concrete shall be 3,000 p.s.i., 2-4 in. slump. Flow lines and inside surfaces shall be trowled smooth & uniform at time of pour. Manhole base may be monolithically cast to 8" above barrel of main sewer. Channels shall conform accurately to sewer grade. Install benches to elevation of springline of pipe.

Cast—in—place, monolithic manhole may be substituted with specific approval of the Engineer.

Joints shall be constructed so as to be watertight. See Standard Plan No. S-2.9. Seal all manhol io joints and frame with Infi-Shield "Seal Wrap" Exterior Seal System

Standard Plan No. S-2.5).

10 WhirtyGIG® Manhole Riser /Collar



See Standard Plan S-2.4 for manhole connection details.

', Manholes under 6'-0" in depth from rim to shelf shall have a top slab in lieu of cone (See

- 1. CITY TO SUPPLY METER SPACER, REDUCING TEE AND STRAINER. CONTACT CITY INSPECTOR 2 WEEKS PRIOR TO INSTALLATION
- 2. TEN PIPE DIAMETERS OF STRAIGHT PIPE REQ'D. IN & OUT OF METER. (IF USING 6" PIPE, NO BENDS ALLOWED WITHIN 5" OF THE METER IN EITHER DIRECTION. IE: 6" x 10 = 60")
- 3. CONTRACTOR SHALL USE APPROPRIATE METHODS TO ENSURE COPPER PIPE, FITTINGS AND JOINTS WILL REMAIN LEAK-TIGHT.

N.T.S.

2" GALV. NIPPLE

- 2" GATE VALVE

2" MUELLER CORP STOP

(H-10046 OR EQUAL)

2" DRAIN ROCK

SLOPE 1% MIN

-2" x 4" BRASS NIPPLE

2" BRASS OR TYPE K COPPER TUBING

2"X1" REDUCER 1" 90" GALV. ELBOW OR STREET ELBOW

/4" STL. RING

COMBINATION AIR RELEASE VALVE

AS SHOWN ON PLANS

de milianista de la como de la co

HOLES

H

- SALEM IRON WORKS COVER NO. A2974 OR APPRVD. EQUAL W/4 1/2" VENT HOLES ON 1'-5" CIRCLE

ALL METERS SHALL BE INSTALLED BY THE CITY OF VANCOUVER PER VMC 14.04.170(B) CONTRACTOR TO INSTALL TEMP. SPACER AS PER NOTE 1.

2-GALV. 90° FLBOWS

5. METER BOX IS NOT ALLOWED IN WITHOUT PRIOR APPROVAL

SOLDERED SCREEN ON SOLDER SOCKET END

2-90' GALV. ELBOWS W/NIPPLE

THE PROPERTY.

CONCRETE BASE

24" T&G-

ANHOLE

(TYP.)

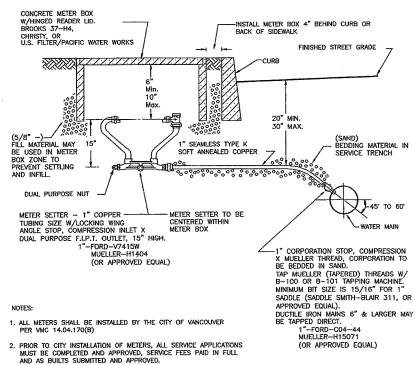
BRASS NIPPLE

2" BRASS 90' ELBOW

1"X24" GALV. NIPPLE

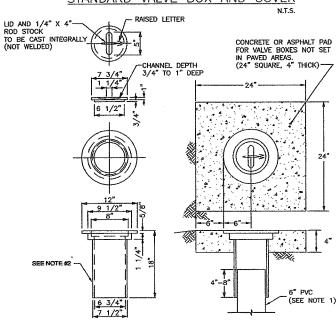
W/O LID

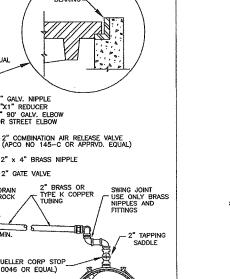
STANDARD WATER SERVICE - 1'



- CONTRACTOR SHALL CONTACT CITY CONSTRUCTION MANAGERS OFFICE (696-8050) 48 HRS. PRIOR TO INSTALLING ANY WATER SERVICE CONNECTIONS.
- METERS WILL NOT BE SET BY THE CITY PRIOR TO DISINFECTION OF THE MAIN AND SERVICE, AND, PRIOR TO A SUCCESSFUL BACTERIOLOGICAL TEST.
- 5. WATER SERVICES SHALL BE PRESSURE TESTED ALONG WITH THE MAIN.
- 6. DURING THE PRESSURE TEST, THE MAIN SHALL BE OPEN TO INSPECTION AT ALL CORPORATIONS.
- 7. METER BOX IS NOT ALLOWED IN HARD SURFACE AREAS WITHOUT PRIOR APPROVAL

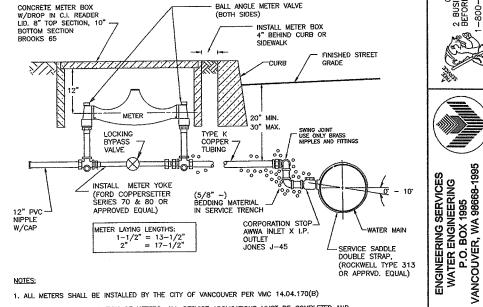
STANDARD VALVE BOX AND COVER





- NOTES: 1. EXTENSIONS SHALL BE 6" ASTM D 3034 SDR 35 PVC PIPE (ONE PIECE)
- 2. U.S. FILTER/PACIFIC WATER WORKS NO. 910 OR EQUAL
- 3. THERE SHALL BE 1/2" CLEARANCE UNDER THE PIN CAST INTO THE LID.

STANDARD WATER SERVICE - 1 1/2" & 2'

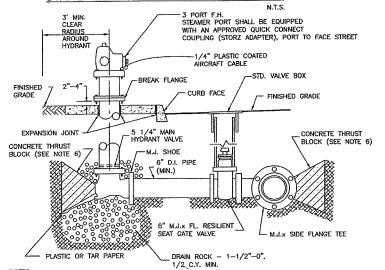


NOTES:

(OR APPROVED EQUAL)

- 1. ALL METERS SHALL BE INSTALLED BY THE CITY OF VANCOUVER PER VMC 14.04.170(B)
- PRIOR TO CITY INSTALLATION OF METERS, ALL SERVICE APPLICATIONS MUST BE COMPLETED AND APPROVED. SERVICE FEES PAID IN FULL AND AS-BUILTS SUBMITTED AND APPROVED.
- CONTRACTOR SHALL CONTACT CITY CONSTRUCTION MANAGER'S OFFICE (360)696-8050 48 HOURS PRIOR TO INSTALLING ANY WATER SERVICE CONNECTIONS.
- METERS WILL NOT BE SET BY THE CITY PRIOR TO DISINFECTION OF THE MAIN AND SERVICE, AND PRIOR TO A SUCCESSFUL BACTERIOLOGICAL TEST.
- 5. WATER SERVICES SHALL BE PRESSURE TESTED ALONG WITH THE MAIN.
- 6. DURING THE PRESSURE TEST, THE MAIN SHALL BE OPEN FOR INSPECTION OF ALL CORPORATION STOPS.
- 7. USE 1-7/8" BIT FOR ALL 2" SADDLE TAPS AND 1-3/8" BIT FOR 1-1/2" SADDLE TAPS.
- 8. METER BOX IS NOT ALLOWED IN HARD SURFACED AREAS WITHOUT PRIOR APPROVAL





- 1. FIRE HYDRANT INSTALLATIONS SHALL BE APPROVED BY THE CITY INSPECTOR PRIOR TO BACKELLING.
- 2. FIRE HYDRANT LOCATIONS SHALL BE AS SHOWN ON THE PLANS, FIRE HYDRANTS SHALL NOT BE SET UNTIL LOCATION AND DEPTH ARE APPROVED BY THE CITY.
- FIRE HYDRANT STANDARD BURY IS 4' UNLESS OTHERWISE NOTED ON THE PLANS.
- A 4'x4'x4" CONCRETE PAD SHALL BE CENTERED AROUND THE FIRE HYDRANT.
- 5. CONCRETE PAD SHALL BE PLACED FLUSH WIBACK OF CURB OR SIDEWALK. EXPANSION JOINT MATERIAL SHALL BE PLACED BETWEEN THE CONCRETE PAD AND CURB/SIDEWALK.
- IN LIEU OF CONCRETE THRUST BLOCK
 ALLOWABLE JOINT RESTRAINT SYSTEMS (SEE
 SHEET 2) MAY BE USED FOR
 INSTALATIONS OF NOT MORE THAN 18'.
 (1 PIPE LENGTH)
- 8. FIRE HYDRANT MAINS SHALL BE 8" MIN., A 8" MAIN CAN BE USED FOR A DEAD-END RUN OF LESS THAN 50" TO A HYDRANT SUBJECT TO ADEQUATE FIRE FLOW.

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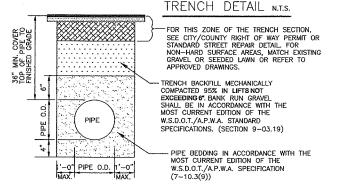
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STANDARD MANUAL AIR RELEASE VALVE N.T.S. ----3'-0" MAX.-EXIST'G. GROUND VALVE 12" MAX. GALV. OR BRASS SWING JOINT COUPLING W/2" ~(TYP.) BRASS PLUG - 2" GATE VALE USE ONLY BRASS HAND TIGHT ONLY NIPPLES AND FITTINGS 2" GALV. PIPE — OR BRASS NIPPLE -2" CORPORATION 2" 90' COMPRESSION -2" BRASS OR TYPE K COPPER I ELBOW (MUELLER CAT. NO. H-15526 OR 2" GALV. OR BRASS NIPPLE-18"-24" LONG APPRVD. EQUAL) 2" COMPRESSION X MJ.P.T. TAPPING SADDLE COUPLING (MUFILER CAT DOUBLE STRAP. (ROCKWELL TYPE 313 EQUAL). OR APPRVD. EQUAL) - WATER MAIN

STANDARD WATER PIPE BEDDING & BACKFILL



STANDARD NOTES:

≥12"

4" MINIMUM

POUR THRUST BLOCK AGAINST UNDISTURBED SOIL. USE THE BEARING AREA OF A TEE

MATCHING THE SIZE OF MAIN.

SIZE OF BLOWOFF DETERMINED BY SIZE AND LENGTH OF PIPE.

(LISE THE STANDARD THRUST

Materials and construction methods shall be in conformance with the most current version of the STANDARD SPECIFICATIONS for ROAD, BRIDGE & MUNICIPAL CONSTRUCTION" as prepared by Wasi of Transportation and the Washington State Chapter of the APWA, except as noted herein. All references to American Water Works Association (AWWA) standards shall mean their latest revision. Operation of, or connection, to existing city water facilities shall only be performed under the observation of authorized City personnel

DUCTILE IRON PIPE:

All water main pipe furnished shall be new ductile iron (DI) pipe conforming to the requirements of AWWA C151. Pipe sizes 12 inch and smaller shall be Class 52 and pipe 14 inch and larger shall be Class 51 or Pressure Class 350, unless otherwise noted on the plans

All pipe shall be furnished in 18 to 20 foot lengths and shall be cement lined per **AWWA C104.**

All rubber gasket joints for ductile iron shall conform to the requirements of AWWA C111

DUCTILE IRON FITTINGS:

All fittings shall conform to the requirements of AWWA C110 or C153. Fittings shall be of the size, type and type of joint as called for on the plans. All fittings shall have a pressure rating 250 psi minimum. All fittings shall be ductile

iron unless approved by the City. All ductile iron fittings shall be cement lined.

All rubber gasket joints for ductile iron fittings shall conform to the requirements of AWWA C111. All compact fittings shall be DI, cement lined, and be pressure rated to 350 psi.

All reducers 6 inch and larger shall be restrained.

All vertical elbow installations shall be engineered and calculations submitted with plans to the City's Engineering Division for approval.

Bolts for buried flanged fittings shall be galvanized or zinc-cadmium plated and coated with 2 coats of bitumastic after installation. Bolts for mechanical joints shall be NSS Corten steel or Ductile iron only.

No Fig x Fig fittings allowed, except compound meter installation, DCVA and RPBA details.

RESTRAINED JOINT PIPE:

strained Joint Pipe, as called for on the plans, and shall be either TR Flex by US Pipe, LoK Ring by American Pipe or approved equal.

ALLOWABLE JOINT RESTRAINT SYSTEMS:

On water main fittings and valves 12 inch dia. and smaller, mechanical joint restraining glands, Megalug brand or approved equal may be used in lieu of thrust blocks. See "Design Requirements" section 2-1.11 regarding the number of joints adjacent to a fitting that must be restrained. The min. working press. ating of restrained joint systems shall be 350 psi. Restraining gas used where thrust restraint is reg'd, for push-on joint (Tyton) pipe, 12 inch or smaller. Restraining gaskets shall be US Field Lok or approved equal and

installed as per manufacturer's written instructions. Tie rods as joint restraint

PIPE

PUSH ON JOINT PLUG

BELL END ONLY

VALVES:

4"X4" NEW CEDAR BLOCK EACH SIDE OF PIPE AGAINST PLUG & CONC. BLOCKING. 8" & GREATER USE TREATED 12"X12" TIES.

RESILIENT SEAT OR -

WEDGE GATE VALVE

STANDARD-VALVE

BOX NO. 910

SEE FIG."A" FOR DIA. -

GALV. PIPE

ted gate valves may be used for valve installations of 8 inch and smaller and shall be used on all fire hydrant and fire protection service. Resilient-seated gate valves shall be conform to AWWA C509 and shall be epoxy coated on the inside.

rfly valves may be used for installations of 6 inch and 8 inch, except for hydrant and fire protection

nyorram are me processon.

Butterfly valves shall be used for all valve installations of 10 inch and larger.

Butterfly valves shall conform to AWWA C504 and shall be class 150-B with short body.

Butterfly valves shall be required to have a minimum of 28 turns to move fully open to fully closed. The operator shall be mounted directly on the valve with no exposed or external couplings. Units shall be fully gasketed and grease packed. Valves shall be installed with the operator on the side of the pipe nearest the road centerline. All valves shall be furnished with an underground manual (AWWA 2 inch square) operator opening with a counterclockwise rotation. Install the operator nut such that the depth from finish grade to the operator nut will not Size on size taps on steel pipe shall not be allowed.

No Fig x Fig valves allowed.

VALVE BOXES

Valve boxes shall be Pattern No. 910, cast iron or approved equal. Valve box extensions shall be one piece and constructed of 6" ASTM D 3034 SDR 35 PVC

Valve boxes not set in paved areas, shall be set in a concrete or asphalt pad.

STANDARD AIR RELEASE VALVES:

Manual and combination air release valves are to be furnished as called for in the plans. Valves shall be of the size indicated and shall be suitable for working the plans. pressure of 150 p.s.i.

lease valves shall be installed at the crest of pipe runs. Valves shall be APCO No. 145C or approved equal

STANDARD BLOWOFF ASSEMBLY:

Standard blowoff assemblies are to be placed 1 foot from the end of a dead end All hydrants shall be 3 port with (2) 2-1/2 inch hose nozzles with national main, when the main will not be extended. Standard blowoff assemblies shall be standard fire hose coupling screw thread, 7-1/2 threads per inch, and (1) 4-1/2 placed at low points in the main, as indicated in the plans, to allow for main

STANDARD TEMPORARY BLOWOFF ASSEMBLY:

emporary construction blowoff assemblies shall be placed on the end of water mains that will be extended, or connected to at a later date

Tapping sleeves shall be rated at 150 p.s.i. working pressure with ANSI/AWWA C207 Class D 150 pound flanges or equivalent stainless steel pattern. All sleeves shall be designated by the manufacturer as suitable for the service proposed. All fabricated steel tapping sleeves shall have fusion-applied epoxy

coating. All stainless steel tapping sleeves shall have stainless steel nuts and

All bolts for the sleeve body shall be the drop-in type, not welded. All nuts and bolts shall be stainless steel (with nuts or bolts treated to prevent galling) or high-strength, low alloy steel bolts with the steel meeting ANSI/AWWA C111/A21.11 specifications. After a tap is made, all exposed areas of the pipe and sleeve shall be coated with either bitumastic coating or Brown primer and Trenton #1 wax or approved equal.

Tapping sleeve gaskets shall be NSF approved for potable water.
Sleeves shall be tested, on the pipe, at 150 p.s.i. for 15 minutes with no pressure drop prior to making the tap.

All sleeves shall have a test outlet and plug.

Concrete blocking for sleeves shall be the same as required for an equal sized

Sleeves furnished for ductile iron pipe taps, reduced outlet taps on steel pipe, or reduced outlet taps on cast iron pipe larger than 12 inch, shall be fabricated steel with outlet gasket. JCM 412, Dresser style 610, Smith-Blair 622, Romac FTS420, Ford FTSC or approved equal. For reduced outlet taps on steel, JCM 422 is also approved.

Tapping sleeves furnished for taps on cast iron 12 inch and smaller, or taps on asbestos cement pipe, shall be stainless steel with full circumferential gasket: Romac SST III, JCM 432, Smith-Blair 664/5, Dresser 630, Ford FTSS or approved equal.

Tapping sleeves for pipes not listed above must be approved by the City.

TAPPING VALVES:

Tapping valves shall have the same construction as specified for gate valves nlet end of valve shall be flanged and outlet end shall be mechanical joint. Tapping valves shall be supported by an 8"x8" concrete block prior to making the tap.

Tapping sleeves and valves shall be used only when specifically called for on

STANDARD FIRE HYDRANT ASSEMBLY:

All fire hydrants shall conform to AWWA standard specifications (C-502) for fire

All hydrants shall be of the latest design that the manufacturer is producing inch steamer nozzle with storz quick connect fitting or equal. Quick connect coupling: Aluminum alloy hydrant adapters shall be 5 inches and

secured to steamer nozzle if adapter is threaded on steamer nozzle. Each unit shall have 1/4 inch #20 thread stainless steel set screws for permanently securing adapters to hydrant. Each unit will have a blind cap with plastic coated aircraft cable attaching it to the hydrant steamer post. Facing on the adapter shall be metal and not rubber gasketing to avert sticking during freezing weather conditions. The blind cap shall fit the adapter tight enough so that it cannot be

removed without a spanner wrench.

All hydrant nozzle caps must be installed with gaskets.

All hydrants shall have 'O' ring seals on the operating stem. All working parts shall be of bronze and all 'O' ring surfaces shall be rust-free material. The

compression hydrant operating threads shall be lubricated and shall be 'O' ring sealed from water, moisture and foreign matter. The operating nut shall be 1-1/2" square.

The center of the lowest port shall be at least 17 inches from the ground bury

All hydrants shall be constructed with mechanical joint connections and provisions shall be made to automatically drain the barrel in order to protect the unit from freezing. The barrel shall be a minimum 7 Inches I.D. and of such length as to be suitable for installation with connections to piping. Minimum barrel length shall be 28-1/4 inches. All working parts shall be removable through the top of the hydrant without the necessity of digging. All hydrants sha or and exterior prepared and coated or painted per AWWA standard C502. The exterior of the barrel shall be factory painted safety vellow. The storz adapter shall not be painted. Tie rods in lieu of thrust blocks are not approved joint restraint, and will not be allowed.

TRENCH EXCAVATION, BEDDING AND BACKFILL:

The existing road surface shall be cut in a neat line by saw cutting or wheel cutter prior to removal.

Trench backfill shall be according to the backfill section, shown on the plans and/or the utility permit.

All excess material not used for trench backfill shall be removed and disposed

by the contractor.

nent of backfill shall be brought up to substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. During construction, the contractor shall stockpile the excavated trench materials so as to do the least damage to adjacent lawns, gardens, shrubbery, trees or fences, regardless of the ownership of these areas. All excavated materials shall be removed from these areas, and these surfaces shall be left in a condition equivalent to or better than their original condition and free from all rocks, gravel, boulders or foreign material. Replace topsoil areas as specified. All existing drainage ditches and culverts shall be reopened and graded, and original drainage restored. All damaged imigation, house drainage pipe, drain tiles, sewer laterals and culverts shall be repaired or replaced. All clearing, grubbing and stripping shall be performed in advance of excavation ons. All weeds, roots, trash, debris and similar objectionable material shall be removed from excavation areas. All asphalt rubble, rocks, trash or debris shall be hauled away. Asphalt pavement shall be neatly saw-cut at designated limits and shall be removed and hauled away.

COMPACTION OF BACKFILL:

The inspector may conduct periodic testing of backfill compaction, using a nuclear densometer, at intervals of his choosing. The contractor shall provide afe trench conditions at all times for testing any depth. Compaction control tests to determine optimum moisture content and maximum

- density shall be by the following methods:

 1. For non-granular materials Method of test for compaction control of nongranular materials (WSDOT Test Method No. 609)
- 2. For granular materials Method of test for compaction control of granular materials (WSDOT Test Method No. 606)
- 3. Field moisture and density of backfill material shall be determined by the Nuclear Moisture/Density Gauge

1. ALL BLOCKING SHALL BE POURED AGAINST FIRM UNDISTURBED SOIL

SOIL BEARING = 2000 LB/FT 2

HORIZ.

TEE 90° 45° 22-1/2° 11-1/4° TEE 90° 45°

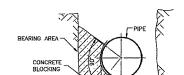
11-1/4 15E 15E 156 22-1/2* 6.7 1-1/4* 3.8 33.6 18.2 18.2 18.2

11-1/4 4.7
TEE 29.9
90° 42.2
45° 42.2
11-1/4° 5.9
TEE 52.3
90° 74.0
45° 40.0
42-1/2° 20.4
11-1/4° 10.3

STANDARD THRUST BLOCK N.T.S.

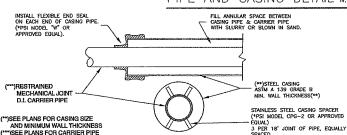
ALL CONCRETE BLOCKING SHALL BE POURED IN PLACE WITHOUT DIRECT CONTACT TO PIPE, FITTINGS OR FLANGES.
 LB. ASPHALT-IMPREGNATED FELT, OR EQUIVALENT AS APPROVED BY THE INSPECTOR, SHALL BE PLACED BETWEEN THE CONCRETE AND PIPE, FITTINGS OR FLANGES.

- 3. LAYOUT TO BE APPROVED BY THE INSPECTOR PRIOR TO AND AFTER
- CONCRETE FOR ALL BLOCKING SHALL HAVE A 28-DAY MINIMUM COMPRESSIVE STRENGTH OF 2,300 P.S.I.
- THIS CHART IS NOT APPLICABLE TO VERTICAL BENDS. LOCATION SPECIFIC DESIGN IS REQUIRED FOR SUCH INSTALLATIONS
- WHERE THE TRENCH SOIL HAS A BEARING PRESSURE LESS THAN 2000 POUNDS PER SQUARE FOOT, LOCATION SPECIFIC DESIGN IS REQUIRED.



UNDISTURBED __

PIPE AND CASING DETAIL N.T.S.



1. PUBLIC AND PRIVATE MAINS SHALL BE PLACED IN SEPARATE CASINGS.

CALL 2 BUSINESS I BEFORE YOU

ENGINEERING SERVICES WATER ENGINEERING P.O. BOX 1995 VANCOUVER, WA 98668-1995

DRS DIG

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DETAILS

3. NO PRIVATE UTILITIES SHALL BE ALLOWED IN CITY OF VANCOUVER CASINGS.

The contractor shall fill all open trenches at the completion of each day's work. Open trenches overnight shall not be allowed. Trenches filled but not compacted shall be re-excavated the following working day and compacted according to

CUTTING AND PLUGGING EXISTING PIPE:

Where shown on the plans, the contractor shall cut and plug the existing main. The existing main, which is to be abandoned, shall have a concrete plug poured around and in the end of the pipe to be abandoned and the part of the main which is to remain shall have a new metal cap or plug installed on the existing pipe, cross or tee, or shall be connected to the new fitting or pipe with thrust restraint. All valve boxes on mains which are abandoned (cut and plugged) shall be removed and the holes shall be patched to match finished surface

CUTTING PIPE:

Cutting of all pipe and specifically asbestos cement pipe shall conform to the es and regulations of the Department of Labor and Industrie

WATER SERVICES:

Water services are to be installed by the contractor, inspected by the City. Call (360) 696-8050 48 hours in advance.
Water meters will be installed by the City only when the following have been

- 1. Acceptance of newly installed mains and services by the Construction
- Manager including: a. Disinfection, flushing and testing mains.
- b. Submittal and approval of record drawings.
 Payment of required hook-up fees and main charges.
- The minimum water service size to be installed shall be 1 Inch, constructed of
- seamless type K soft arrealed copper. ABANDONING A WATER SERVICE:

If an existing meter is to be taken out of service, when the main is not being

abandoned, the service shall be abandoned by turning off the corporation stop at the main, followed by cutting and plugging the service just after the corporation stop and removing the box and meter set (voke).

All sizes of pipe shall be tested hydrostatically as per the requirements of section 7-11.3(11) in the most current version of the W.S.D.O.T. Standard Specifications or at 150 p.s.i. for 15 minutes with no pressure drop.

DISINFECTING WATER MAINS:

Disinfection and bacteriological testing of water mains shall conform to the requirements of AWWA C651.

PREVENTING REVERSE FLOW:

Pipelines that have not been disinfected may be connected to the existing distribution system with a pre-tested closed inline valve and only at points approved by the Engineer. The contractor shall supply document valve supplier certifying that the valve has been pre-tested.

SHEET

DETAIL

LINE

'ATER SHEET 2

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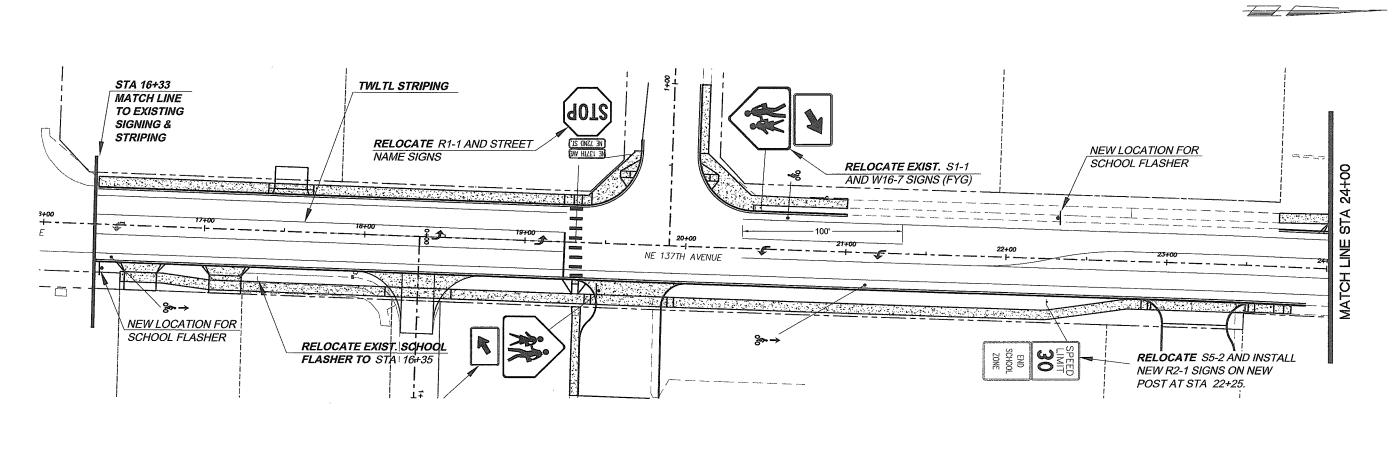
STANDARD

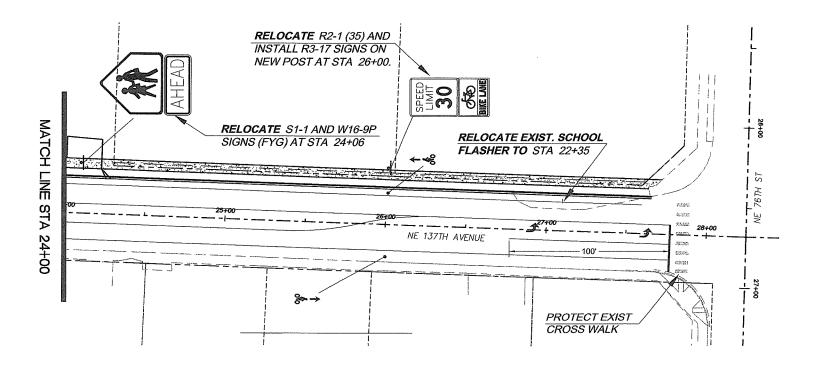
20 E

AVENUE ER STANDARD LJ () 137TH $\frac{\mathbb{Z}}{\mathbb{Z}}$ Z (/) NE

WATERVANCOUVER OFCITY

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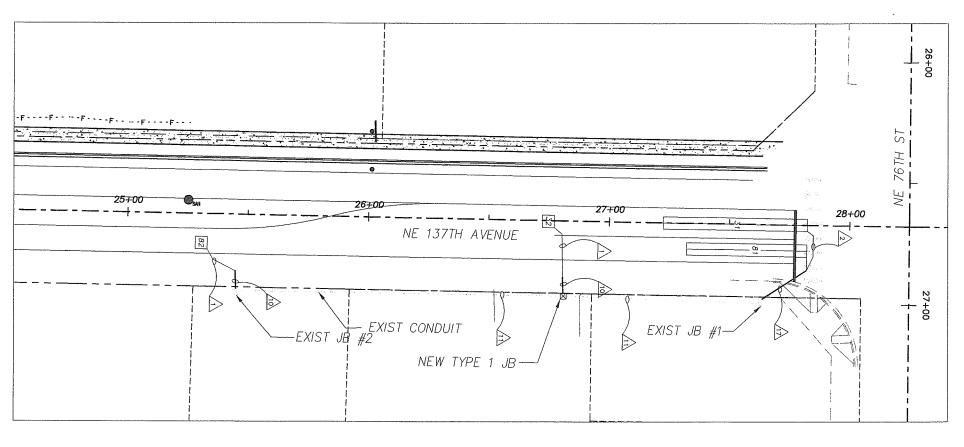




PLAN

NE 137TH AVENUE SIGNING AND STRIPING

SCALE IN FEET



\underline{LEGEND}

▼ Type I electrical junction box (new)

Type I electrical junction box (existing)

rigid metal conduit

rigid polyvinyl chloride PVC) conduit

1 construction note

CONSTRUCTION NOTES:

- $\langle i \rangle$ Loops 32 and 82 shall be 6'X6' square or equivalent 6' diameter circular loops.
- $\langle 2 \rangle$ All loop detectors shall be centered in the lane lines.
- (3) The existing run #11 (1#18- 4 CC/S) shall be pulled back from the existing junction box #2 to the existing junction box #1. The pulled back wire shall be spliced at the new type 1 junction box and the spliced run shall be pulled to existing junction box #2 to power loop detector # 82.
- (4) All traffic signal related work shall be done in accordance with Washington State Standard Specifications for Road, Bridge, and Municipal Construction 2004, section 8-20 (Illumination, Traffic Signal Systems, and Electrical) and section 9 (Materials).

DETECTION SYSTEM NOTES

INDUCTIVE LOOP(S)	TYPE <u>OF_LOOP</u>	SIZE (W x L)	# OF TURNS	DISTANCE (NEAR-FAR) FROM STOP BAR ON THE APPROACH		
82	SQUARE	6' x 6'	4	244' TO 250'		
32	SQUARE	6' x 6'	4	100' TO 106'		
31	RECTANGULAR	(2.5'+2.5') X 60'	2 & 2	-6' TO 54'		
81	RECTANGULAR	(25'+25') X 50'	2 & 2	-6' TO 44'		

All loops shall be centered in the detected lane, except vehicle loops adjacent to curbs shall be located to have $3'-0^{\circ}$ between the sawcut and the lane line to the left of the loop.

				WII	RING	SCHE.	DULE	,				
				DETECTION		ILLUMINATION						
RUN NO.	Enclosure Or Attachment	TRAFFIC SIGNALS	PEDESTRIAN SIGNALS	INDUCTIVE LOOPS	PEDESTRIAN	POWER	BRANCH	OPTICAL PREEMPTION	Signal System Power	COORDI NATION	WIRED SPARES	RUN NO.
1	SAW-CUT			2#12TP								1
2	SAW-CUT	<u> </u>		4#12TP								2
10	1" PVC			2#12TP							1	10
11	2" PVC			1#18-4cc/s			<u> </u>					11
17	1" PVC			8#12TP							1	17

*Connect to existing spare 2*RM conduit in the controller cabinet base. cc = five conductor #14 AWG traffic signal control cable RM = Rigid Metal conduit

PB = Pole and Bracket cable TP = Twisted Pair(s) of #12AWG Type USE loop wires

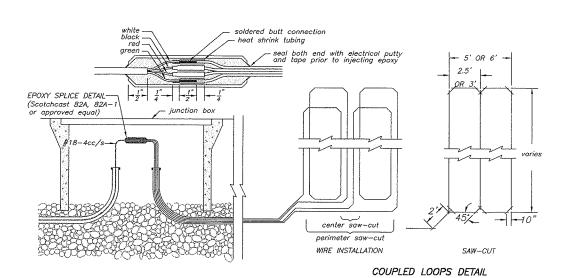
PVC = Rigid Polyvinyl Chloride (plastic) conduit

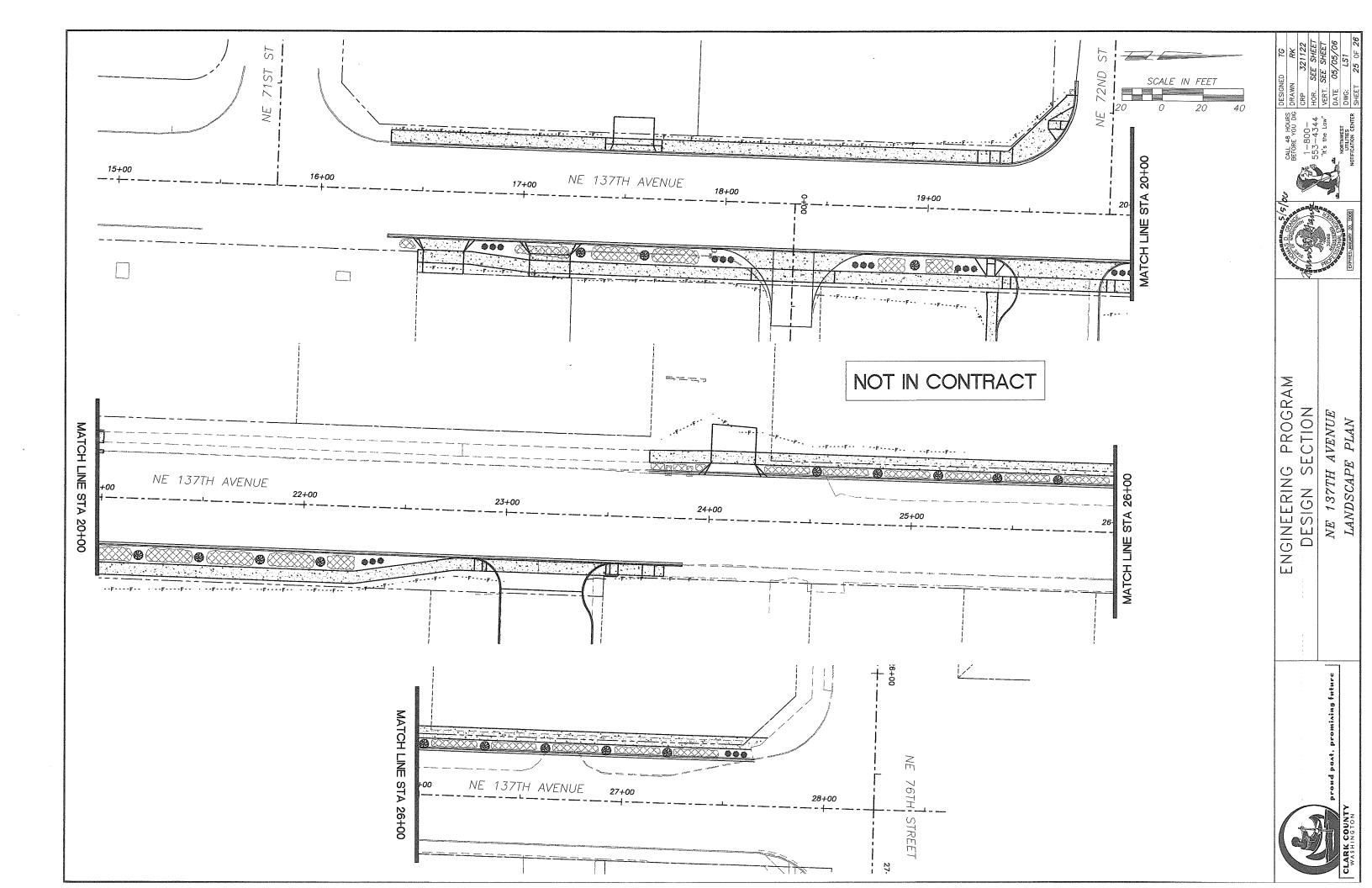
cc/s = multi-conductor communication cable having stranded copper conductors aluminum/polyester foil shield, and high-density polyethylene jacket insulation.

DETECTION RACK (FXISTING)

		מנט	ILCI	1010	1 123 (21)	1221	DIIIV	0)	
	1	2	3	4	5	6	7	8A	88
	PWR. SUPPLY	VEHICLE	VEHICLE	VEHICLE	VEHICLE	VEHICLE	VEHICLE	PRE EMPT.	PRE EMPT.
♦	MODULES 2&3	11/61	62	21/51)	22	72	31	NORTH BOUND	EAST BOUND CHANNEL A
2>	MODULES 4&5	52	63	12	23	42	41	CHANNEL A	
3>	MODULES 6&7	13	64	53	24	32	77	SOUTH BOUND	WEST BOUND
4>	SPARE	14	65	54	25	82	81	CHANNEL B	CHANNEL B
					· · · · · · · · · · · · · · · · · · ·	·	·		

COMMON HOME-RUN CABLE (#18-4cc/s)





Z

PROGRAM:CTION 00

NATIVE SOIL AND 50% COMPOST PLANTING HOLE TO BE MINIMUM 2 TIMES LARGER THAN

ROOTBALL SIZE

3/4" TREE

CHAINLOCK TIE TWO 2" x 2" x 6'

TREE STAKES

- FINISH GRADE

ROOT CROWN LEVEL

WITH FINISH GRADE

3' x 3' WEED MAT

BACKFILL WITH 50%

TREE PLANTING DETAIL

NOT TO SCALE

Planting Size | Spacing

Spacing

Spacing

Planting Size

Planting Size

Gallon

2 Gal.

BERM

3" TO 4

LAYER OF

BARK MULCH

PLACE TREE ON-

FIRM GROUND TO

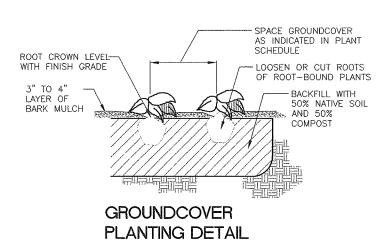
PREVENT SETTLING

NOTE: FOR ALL TREES INSTALL POLYPROPYLENE TREE ROOT BARRIER. MINIMUM 18" DEEP, 0.08" OR 2MM THICK. APPROXIMATELY 10' LONG. ABUTTING SIDEWALK EDGES AND

PLANTING NOTES

- 1. CONTRACTOR SHALL VERIFY ALL QUANTITIES, MEASUREMENTS, AND SITE CONDITIONS.
- 2. PLANTING PERIOD IS FROM APPROXIMATELY OCTOBER 15 TO APRIL 15, WEATHER DEPENDENT.
- 3. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING
- 4. INSTALLED PLANTS SHALL BE IMMEDIATELY WATERED IN BY CONTRACTOR.
- 5. ALL PLANT MATERIALS SHALL CONFORM IN SIZE AND GRADE TO THE "AMERICAN STANDARD FOR NURSERY STOCK",
- 6. PLANTS SHALL BE INSTALLED ACCORDING TO DETAILS
- 7. NO SUBSTITUTIONS IN PLANT VARIETIES SHALL BE MADE WITHOUT APPROVAL FROM THE COUNTY LANDSCAPE DESIGNER.
- 8. LANDSCAPE WORK SHALL BE REVIEWED AND APPROVED BY THE COUNTY ENGINEER. SOME FIELD ADJUSTMENT MAY BE NECESSARY TO REFLECT ACTUAL GRADING AND
- 9. TREES AND SHRUBS SHALL HAVE 3' X 3' WEED MAT PLACED AROUND THEM AND SECURED WITH 8" STAPLES AFTER INSTALLATION.
- 10. FOLLOWING PLANT INSTALLATION AND PLACEMENT OF WEED MAT, 3" TO 4" OF BRIGHT MEDIUM RED BARK DUST, SHALL BE SPREAD THROUGHOUT PLANTING STRIPS.
- 11. FOLLOWING PLANTING, TREES SHALL BE STAKED ACCORDING TO DETAIL SHOWN.
- 12. FOLLOWING COMPLETION OF LANDSCAPE PROJECT, SITE SHALL BE MAINTAINED WEEKLY. MAINTENANCE SHALL INCLUDE: ADEQUATE WATERING OF ALL INSTALLED PLANTS TO ENSURE HEALTH AND SURVIVAL, REMOVING WEEDS FROM SITE, MOWING GRASS AS NEEDED, MONITOR TREE STAKES AND TIES TO ENSURE PROPER SUPPORT AND TO PREVENT TIES FROM GIRDLING TRUNKS. REMOVE TREE STAKES AND TIES AFTER ONE YEAR MINIMUM, OR AS NEEDED UNTIL ADEQUATE ANCHORING IS ATTAINED. BARKDUST SHALL BE REAPPLIED AS NEEDED.

NOT IN CONTRACT



NOT TO SCALE

LOOSEN OR CUT ROOTS OF ROOT CROWN LEVEL ROOT-BOUND WITH FINISH GRADE PLANTS 3' x 3' WEED MAT 3" TO 4" ----3" BERM LAYER OF -FINISH GRADE BARK MULCH BACKFILL WITH 50% NATIVE SOIL AND PLACE SHRUB ON-50% COMPOST FIRM GROUND TO PREVENT SETTLING PLANTING HOLE TO BE MINIMUM 2 TIMES LARGER THAN ROOTBALL SIZE

Arctostaphylos uva—ursi 'Massachusetts'|'Massachusetts' Kinnikinnick

PLANT SCHEDULE

Common Name

Common Name

David Viburnum

Common Name

Crimson Sentry Norway Maple 1 1/2" Cal.

SHRUB PLANTING DETAIL

NOT TO SCALE

Symbol Scientific Name

Symbol Scientific Name

Symbol Scientific Name

W Viburnum Davidii

Acer platanoides 'Crimson Sentry'

8

Groundcover

Shrub